CAIT
Center for Advanced Infrastructure & Transportation
Rutgers, The State University of New Jersey

NJDOT Bureau of Research
QUARTERLY PROGRESS REPORT

Project Title:	Development of Airport Obstruction Identification System
RFP NUMBER:	NJDOT RESEARCH PROJECT MANAGER: Ed Kondrath
TASK ORDER NUMBER: 115 / 4-26857	PRINCIPAL INVESTIGATOR: Patrick Szary
Project Starting Date: : 01/1/2002 **Original** Project Ending Date: 12/31/2003 **Modified Completion Date:** 12/31/2004	Period Covered: 2nd Quarter 2004

Task	% of Total	% of Task this quarter	% of Task to date	% of Total Complete
1. Literature Search	10%	0%	100%	10%
2. Develop criteria	5%	0%	100%	5%
3. Evaluate the cost effectiveness	8%	0%	100%	8%
4. Conduct laboratory experiments	5%	0%	80%	4%
5. Conduct laboratory/field experiments	15%	0%	90%	13.5%
6. Develop prototype software	25%	0%	80%	20%
7. Demonstrate field test system	5%	30%	55%	2.75%
8. Redesign a new prototype	5%	10%	90%	4.5%
9. Demonstrate prototype system	5%	10%	40%	2%
10. Train NJDOT personnel	7%	40%	75%	5.25%
11. Final Report	10%	10%	20%	2%
TOTAL	100%			77%

Project Objectives:

Project Abstract:

1. Progress this quarter by task:

A. The GPS unit was delivered along with the pan and tilt system which was ordered from Remote-I in California.
B. The Industrial Twin Helicopter has begun to undergo the installation of the components for the system. This work is anticipated to take a few weeks to complete.
C. The airport selection process was continued to determine a good facility for testing the system once the unit is complete.

2. Proposed activities for next quarter by task:

A. The completion of the integration of the Bergen Industrial Twin and outfitting the unit with all the necessary components for testing.
B. Completing the training of DOT personnel with a one-week intensive training session that is to take place.
C. Test flying the helicopter at the chosen airport and sending acquired images to Oakland University for post processing and producing a detailed map.

3. List of deliverables provided in this quarter by task (product date): n/a

4. Progress on Implementation and Training Activities:

Trainings sessions were resumed this quarter. Plans are currently being made to conclude the training process.

5. Problems/Proposed Solutions:

The timeframe for the helicopter mount has taken slightly longer than expected and should be completed early next quarter if not by the end of the current quarter. All of the equipment for the helicopter has arrived and is with Chuck Wildey for integration.

Total Project Budget	$210,000.00
Modified Contract Amount:	
Total Project Expenditure to date	$111,424
% of Total Project Budget Expended	53%

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NJDOT Bureau of Research
QUARTERLY PROGRESS REPORT

Project Title:	Use of LED or Other New Technology to Replace Standard Overhead & Sign Lighting
RFP NUMBER:	NJDOT RESEARCH PROJECT MANAGER: Ed Kondrath
TASK ORDER NUMBER: 148 / 4-29090	PRINCIPAL INVESTIGATOR: Pat Szary
Project Starting Date: 1/1/2004 **Original** Project Ending Date: 12/31/2004 **Modified Completion Date:**	Period Covered: 2nd Quarter 2004

Task	% of Total	% of Task this quarter	% of Task to date	% of Total Complete
Literature Search	5%	0%	100%	5%
1. Comprehensive Literature Review	20%	70%	100%	20%
2. Develop a Cost Benefit Model	30%	30%	30%	9%
3. Experimental Process & Implementation	25%	20%	20%	5%
4.Analysis of Experimental Data	15%	0%	0%	0%
Final Report	5%	0%	0%	0%
TOTAL	100%			39%

Project Objectives:

The goal of this study is to provide NJDOT with information concerning the replacement of standard overhead and sign lighting with LED or new technology. The study should meet four basic objectives:

1. Reduce operating costs while upholding the quality of the roadway environment, in relationship to nighttime visibility.
2. Provide NJDOT with the information such that they can substitute out-of- date technology with newer, more efficient lighting equipment such as sulfur light, bright white LED light, QL lighting, and other technologies.
3. Supply NJDOT with a lighting plan that is able to offer equal or better illumination with significantly lower energy consumption and cost.
4. Establish a lamp replacement, cleaning, and equipment maintenance schedules that ensure quality lighting while enabling NJDOT maintenance staff to focus on higher priority tasks.

Project Abstract:

The research team will gather information on existing bulbs and hardware commonly used by NJDOT. This information will help to establish a baseline for the cost/benefit analysis. This study will include systems such as overhead street lamps and roadside signboards that are illuminated. A comparison will be made between the different lighting technologies presently used as well as those identified in the literature search that may not yet be mainstream. All bulbs will be compared in a performance test to determine their respective efficiencies. Bulb recommendations will be made after analyzing results on specific criteria (power consumption, illumination, durability, bulb life, etc.) The data collected in the research phase of the study will be compared to that found in the literature review, to assist in the verification and evaluation of experimental results. Bulb comparison is discussed in more detail as part of the Phase II section of this proposal. The overall testing procedures for the bulbs will be determined as a part of Task 2, thus addressing any special problems specific to individual technologies.

1. Progress this quarter by task:
   - Initial literature search is complete, and we have received specs from Caltrans and Connecticut DOT .

- Completed comprehensive literature search and deliver a short memorandum documenting our initial findings, approach, and feasibility/costs.
- Met with Dan Black of NJDOT to discuss the findings of the literature search and set up a testing plan to evaluate different types of lamps in both roadway signs and overhead lighting fixtures. Dan said that he would setup testing fixtures at the DOT maintenance yard in Ewing.
- Vendors are currently being contacted to supply lamps for testing in actual fixtures at NJDOT in Ewing. A sample size of at least ten lamps is desirable after initial testing has weeded out the unacceptable lamp types

2. Proposed activities for next quarter by task:

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- Complete research plan and begin implementation of such plan.
- Install lamps at DOT maintenance yard for evaluation with DOT personnel
- Evaluate solar lighting technology and led lamps
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3. List of deliverables provided in this quarter by task (product date):
   - Completed list of lamp types set for evaluation
   - Setup of testing fixtures at DOT in Ewing

4. Progress on Implementation and Training Activities:
   - N.A.

5. Problems/Proposed Solutions:

Total Project Budget	$146,000
Modified Contract Amount:	
Total Project Expenditure to date	$3,948
% of Total Project Budget Expended	3%

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NJDOT Bureau of Research
QUARTERLY PROGRESS REPORT

Project Title:	The Future of Transportation Modeling
RFP NUMBER: NJDOT 2001-19	NJDOT RESEARCH PROJECT MANAGER: Nazhat Aboobaker
TASK ORDER NUMBER: 117 / 4-26856	PRINCIPAL INVESTIGATOR: Maria Boilé
Project Starting Date: 01/01/2002 **Original** Project Ending Date: 12/31/2003 **Modified Completion Date: 12/31/2004**	Period Covered: 2nd Quarter 2004

Task	% of Total	% of Task this quarter	% of Task to date	% of Total Complete
Literature Search				
1. Model comparison and summary matrix	25%	0%	100%	25%
2. Conduct survey	25%	0%	100%	25%
3. Plan to be followed by the Bureau of Technical Analysis	20%	20%	75%	15%
4. Implementation and Training	15%	10%	75%	11.25%
Final Report	15%	5%	75%	11.25%
TOTAL	100%			87.5%

Project Objectives:
The objectives of this study are to
(1) Determine the future trends and directions of practical travel demand models and processes over the next five years.
(2) Compare the next generation alternatives with the traditional modeling processes and programs in order to recommend which models and processes are likely to become the next standards.
(3) Provide staff training for the Bureau of Technical Analysis on the capabilities of the models which will be identified as the future industry standards and the requirements for transition to the new standards, from models currently used by the Bureau.

Project Abstract:
Careful planning will help avoid problems with severe traffic congestion, dangerous travel patterns, undesirable land use patterns, adverse environmental impact and wasteful use of money and resources. Planners need to implement the appropriate set of tools, which will help create high quality transportation services at a reasonable cost with minimal environmental impact and meet the requirements of ISTEA, TEA-21 and the CAAA. The scope of this project is to identify and assess the new trends in transportation modeling and assist the NJDOT Technical Analysis Bureau in making educated decisions regarding their future transportation modeling needs. For this purpose, a comparative evaluation of the available and under development transportation modeling tools will be performed and the advantages and disadvantages of each one will be discussed in detail and summarized in an easy to read matrix. Projections of future transportation modeling needs will be made and the capability of existing and under development tools to address these needs will be assessed. A comparative analysis of existing models will include among other, information on model capabilities, data requirements, user friendliness, cost, hardware, software and maintenance requirements.

1. Progress this quarter by task:

Task 2: A draft report including the analysis of the survey results has been produced and sent to the advisory board members and to the NJDOT for review and comments. Although a few responses are still awaited for, a

final version of the document has been produced based on the comments that have been received so far. Once the additional expected comments have been received, they will be included in the document.
Task 3: The plan has been revised according to the survey results. The structure of this plan will be discussed in the next quarterly meeting.
Task 4: The interactive tool is in its final form. It will be revised, if needed, when the additional comments have been received.
Final Report: The final report document is being revised continuously to include the new updates.

2. Proposed activities for next quarter by task:
Task 3: Once the final structure of the plan to be followed by the Bureau of Technical Analysis if they wish to switch from their current models to others identified as future standards has been agreed upon, additional work on further developing this plan will be performed.
Task 4: If needed, based on the additional expected comments, updates on the interactive tool will be made.
Final Report: the current draft of the final report will be updated

3. List of deliverables provided in this quarter by task (product date):
Survey analysis report.

4. Progress on Implementation and Training Activities:
It has been agreed that the interactive tool and its demonstration will satisfy the requirement for implementation and training activities.

5. Problems/Proposed Solutions:
Review of the survey analysis by some of the advisory board members took longer than expected. A few responses are still awaited. The advisory board members will also be asked to comment on the plan to be followed by the Bureau of Technical Analysis if they wish to switch from their current models to others identified as future standards, which is currently being developed. Due to these delays, a no cost extension has been requested.

Total Project Budget	$125,111
Modified Contract Amount:	
Total Project Expenditure to date	$75,814
% of Total Project Budget Expended	61%

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NJDOT Bureau of Research
QUARTERLY PROGRESS REPORT

Project Title:	Estimation of Truck Volumes and Flows
RFP NUMBER: NJDOT 2001-18	NJDOT RESEARCH PROJECT MANAGER: W. Lad Szalaj
TASK ORDER NUMBER: 116 / 4-26855	PRINCIPAL INVESTIGATOR: Maria Boilé
Project Starting Date: 01/01/2002 **Original** Project Ending Date: 12/31/2003 **Modified Completion Date: 8/31/2004**	Period Covered: 2nd Quarter 2004

Task	% of Total	% of Task this quarter	% of Task to date	% of Total Complete
Literature Search	6%	-	100%	6%
1. Data Collection	8%	-	100%	8%
2. List of major truck generating facilities	8%	-	100%	8%
3. Criteria for factors that influence changes in truck flow	10%	-	100%	10%
4. Relationships between ADT and truck volumes	33%	5%	100%	33%
5. Methods to estimate truck flow and truck percentages	-	-	-	-
6. Validate the estimation method on a selection of 12 routes	17%	20%	75%	12.75%
7. Apply methodology on a statewide basis	8%	40%	60%	4.8%
Final Report	10%	20%	80%	8%
TOTAL	100%			90.55%

Project Objectives:

The objectives of this study are as follows:

- develop a database of truck classification counts, directly linked to existing NJDOT database systems
- develop methodologies for calculating truck volumes, flows and percentages on Interstates/Freeways, and principal arterials where some count information is available, and on lower facilites (principal and minor arterials) where little or no count information is available
- apply the methodology to New Jersey roadways to develop a GIS database of truck volumes, flows and percentages
- evaluate the methodology and the database developed using actual data collected through the NJDOT traffic monitoring system
- validate the method on a section of at least twelve highways, including four Interstate / Toll Authority routes, four principal arterials, two urban major arterials, and two rural major arterials

Project Abstract:

Freight transportation plays a vital role in the development and prosperity of a state such as New Jersey. More than 375 million tons of freight is transported each year in New Jersey. Trucks dominate this movement, accounting for 283 million tons. This project develops a procedure for estimating truck traffic on state highways, based on observed counts. A statistical approach is being developed for estimating truck volumes and flows, based primarily on classification counts and information on roadway functionality, employment, sales volume and number of establishments within the state. Models will be created that may predict the truck volumes at a certain location in the state. Profiles of truck traffic will also be developed for various roadways, indicating the ADT, truck and passenger car volumes and percentages. The procedure will be modeled within a GIS

framework, which facilitates data analysis and presentation. Within this framework, locations in the state highway network may be selected and based on a set of criteria the data associated with the network, truck volumes, traffic profile, truck percentage etc can be estimated. The models would be used to predict truck volumes on locations where actual observations are not available. The predicted volumes along with the observed ones would be used to determine the truck traffic patterns along state highways. Sensitivity analysis will be conducted to detemine how the model behavior changes with variations in the explanatory variables. Although the proposed method will be applied to a selected sample of state highways, a procedure will be developed for the statewide application of this method.

1. Progress this quarter by task:
   Task 4: Both the linear regression and constrained models have been re-estimated based on a new set of explanatory variable data. The reason for this change had been discussed during the last quarterly meeting at the NJDOT. The new models overcome the identified problems and seem to work better than the previous ones.
   Task 6: The new models have been tested on the selected roadways and predicted volumes are compared to the observed ones. In addition, sensitivity analysis has been performed and the results have been summarized. A GIS based tool has been developed for the purpose of automating the developed approach and facilitating visual observation and analysis of the results.
   Task 7: The procedure for applying the methodology on a statewide basis has been developed and will discussed in the next quarterly meeting.
   Final Report: A final draft of the report has been produced and will be submitted to the NJDOT by the end of May.

2. Proposed activities for next quarter by task:
   Any changes that will be suggested during the next quarterly meeting and any additional changes that will be recommended by the NJDOT staff after their review of the draft final report will be addressed during the next quarter.

3. List of deliverables provided in this quarter by task (product date):
   Draft final report
4. Progress on Implementation and Training Activities:
   Training material is being developed in parallel to the development of the GIS based framework
5. Problems/Proposed Solutions:
   None

Total Project Budget	$198,566
Modified Contract Amount:	
Total Project Expenditure to date	$153,123
% of Total Project Budget Expended	77%

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QUARTERLY PROGRESS REPORT

Project Title:	Operational Improvements at Traffic Circles (Project 2002-16)
RFP NUMBER:	NJDOT RESEARCH PROJECT MANAGER: Robert Sasor
TASK ORDER NUMBER/Study Number: 129 / 4-26544	PRINCIPAL INVESTIGATOR: Kaan Ozbay (Rutgers) / George List (RPI)
Study Start Date: 01/01/2002 Study End Date: 12/31/2004	Period Covered: 2nd Quarter 2004

Task	% of Total	% of Task this quarter	% of Task to date	% of Total Complete
Phase 1: Preliminary Literature Search	5%	50%	100%	5%
Phase 2				
Task 1: Literature Review	10%	25%	100%	10%
Task 2: Selection and Use of Computer Tool.	10%	100%	100%	10%
Task 3: Evaluation of Operational Alternatives.	30%	5%	1.5%	16.5%
Task 4: Safety Evaluation	20%	10%	30%	6%
Task 5: Cost – Benefit Analysis	10%	10%	40%	4%
Tasks 6: Final Recommendations	5%			
Tasks 7: Administration / Final Report.	10%	20%	20%	2%
TOTAL				53.5%

Project Objectives:

Objective 1: Simulation Modeling and Validation of Geometry and Traffic Patterns of Existing and Proposed Operational Improvement Alternatives of Circles Under Study.
Objective 2: Determination and Evaluation of Operational and Safety Improvement Alternatives using a Series of Measures of Effectiveness (travel time, delays, air pollution, gas consumption, etc.)
Objective 3: Recommendation of best operational and safety improvements based on a rigorous and realistic cost-benefit analysis

Project Abstract:

Traffic circles have been used in the United States since 1905. However, their use has been limited since the 1950s due to the realization that they worked neither efficiently nor safely (NCHRP- WEB Page). Recently, there has been increasing interest in improving existing traffic circles to address these safety and efficiency problems. Several States including New Jersey are in the process of exploring effective operational alternatives for enhancing safety and efficiency of these traffic circles built in the early parts of 20th Century.

Many existing traffic circles in New Jersey that were designed to handle lesser traffic volumes than today's volumes fall under this category of traffic circles that need to be improved since they are faced with increasing congestion and accident problems. Although replacement of these traffic circles appear to be a viable option time and money needed for the construction of alternative solutions can be prohibitive especially in this atmosphere of diminishing resources for any kind of major investment due to the budget problems of the State.

Department of Civil and Environmental Engineering
623 Bowser Rd. Piscataway NJ 08854-8014
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The next best option appears to be the implementation of operational alternatives that can xtend the life of these circles until they can be rebuilt in the next 5 to 20 years.
To study operational alternatives, traffic simulation computer software that can accurately model the geometry & traffic on circles, and provide animated graphics of traffic movements is needed. The major goal of this computer based analysis of the traffic circles as proposed in this study is to accurately evaluate the effectiveness of various traffic engineering measures such as ramp metering, sign and line treatments, reconstructing or adding lanes, in terms of improve traffic flow or safety at a specific circle.

1. Progress this quarter by task:

- **Task 3:** We completed the first phase of data collection at all three circles
  - .Below a summary of our efforts in this quarter:
    - Data extraction is completed for the Asbury circle traffic circle. The extracted data include (i) vehicle counts at every 15 minutes with percentage of trucks and passenger cars, (ii) vehicle inter-arrival times, (iii) vehicle queue wait time before yield signs, (iv) vehicle wait times at yield signs, (v) gap acceptance/rejection times at yield signs.
    - Data collection for the Brooklawn circle is completed. Data collection was performed at Brooklawn circle on April 21th . Data extraction will start next week for this circle.
    - PARAMICS model for the Collingwood circle was calibrated using the traffic counts extracted from the data. Traffic signals have been added to the circle based on the signal timings provided by NJDOT. The calibration for the base year is complete for this circle.
    - Sensitivity analysis for Collingwood circle model both base and proposed scenarios was completed.
    - Also using the API feature of PARAMICS, we have modified the vehicle gap acceptance function based on the extracted data. This modification resulted in more realistic traffic characteristics.
- **Task 4:** RPI team has submitted a technical memo, which explains their approach in assessing the safety improvements in the circle.
  - RPI Team continued to work on analyzing the existing accident data.
  - RPI also continued to work with the Paramics model for the safety analysis.
  - Rebecca Brown, a graduate student from RPI, visited Rutgers on March 28, 29 and 30th. To conduct joint research activities pertaining to the usage of Paramics models for safety. Additional simulation data is provided to RPI for the safety analysis.

- **Task 5:** A draft chapter for the Cost-Benefit analysis is completed. C/B analysis for the Collingwood Circle is also conducted, and included in this chapter.

2. Proposed activities for next quarter by task
   - We will continue Tasks 3, 4 and 5.

3. List of deliverables provided in this quarter by task (product date)
   An interim report on Tasks 3 and 5 – Modeling and calibration Collingwood Circle using Paramics and description of C/B analysis as a methodology and also as applied to Collingwood Circle.

4. Progress on Implementation and Training Activities

Mike Asson was visited on March 10th, March 25th and April 23rd. Paramics software was installed on NJDOT computer, and Collingwood simulation model was copied to that computer for Mike Asson's reviews and feedback. Basic features of Paramics was also demonstrated.
On June 3rd a presentation of the Collingwood circle will be given to NJDOT at Rutgers University.

5. Problems/Proposed Solutions

This quarter our progress was slower than expected mainly due o the very time consuming data analysis, simulation calibration and sensitivity analysis activities. We will also have to go back and collect additional data to support our calibration work. This will be done in the third quarter.

Total Project Budget	$ 422,524
Modified Contract Amount:	
Total Project Expenditure to date	$209,328
% of Total Project Budget Expended	50%

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QUARTERLY PROGRESS REPORT

Project Title:	Evaluation Study of the NJ Turnpike Authority's Value Pricing Initiative
RFP NUMBER:	NJDOT RESEARCH PROJECT MANAGER: Nancy Ciaruffoli
TASK ORDER NUMBER/Study Number: 114 / 4-26514	PRINCIPAL INVESTIGATOR: Kaan Ozbay (Rutgers) / Jose Holguin-Veras (RPI)
Study Start Date: 01/01/2002 Study End Date: 12/31/2004	Period Covered: 2nd Quarter 2004

Task	% of Total	% of Task this quarter	% of Task to date	% of Total Complete
Literature Search	5%	25%	100%	5%
Task 1: Collect socio-economic characteristics of the users.	10%	15%	30%	3%
Task 2: Identification of toll structure changes.	2.5%	100%	100%	2.5%
Task 3: Traffic data collection.	5%	100%	50%	5%
Task 4: Assess impacts on users.	5%	40%	100%	5 %
Task 5: Monitor media and decision-makers' reaction to value pricing	2.5%	30%	80%	2.0%
Tasks 6-7: Assemble panel of users. Collect travel behavior data.	20%	30%	40%	8%
Tasks 8-9: Behavioral modeling. Estimation of econometric parameters.	10%	20%	20%	2%
Task 10: Traffic modeling.	10%	10%	80%	8%
Task 11: Estimate congestion levels and travel time savings/losses for before and after conditions.	10%	10%	30%	3%
Task 12 : Estimate environmental impacts for before and after conditions.	5%	20%	29%	1%
Tasks 13-14: Estimate economic value of travel time savings. Differential impacts among user classes.	5%	10%	60%	3%
Final Report	10%	20%	40%	4%
TOTAL	100%			54.5%

Project Objectives:

Objective I: Descriptive Analysis

A. Operational elements at New Jersey Turnpike Facilities

Describe:

- New Jersey Turnpike: access, geographic areas, speeds, toll collection scheme
- Traffic ordinance violations and enforcement
- Strategy followed by New Jersey Turnpike Authority in implementing EZ-PASS and Value Pricing

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Collect data on:

- Traffic volumes by vehicle type and time of day
- Traffic composition by time of day
- Traffic counts by toll plaza by time of day
- Accidents and incidents

B. Current toll structures and role of electronic toll collection

Describe:

- Implementation strategy: passenger cars, trucks

Assess:

- Acceptance rates and level of penetration of EZ-PASS
- Acceptance of Value Pricing

C. Socio-economic profiles of users

Collect data on:

- Income, gender, ethnicity, travel profile and overall characteristics of users and non users

Estimate through modeling:

- Travel time values
- Direct and cross elasticities
- Income elasticities

D. Media and Decision-Makers' Reaction

- Monitor media and decision-makers reaction to the various stages of implementation of value pricing

Objective 2: Behavioral Analyses

A. Travel Behavior: Passenger Transportation

Collect data and investigate through modeling the characteristics of (long term):

- Vehicle utilization and auto ownership
- Route choice
- Departure time
- Joint processes of route choice and departure time
- Traffic diversion
- Mode choice
- Vehicle occupancies
- Assessment of trip curtailment and before/after trip generation
- Joint processes of trip generation and trip chaining
- User responses to dynamic traffic information and pricing
- The role of the trip length upon the choice processes described above

Objective III: System Wide Impacts

Traffic Congestion Impacts
Environmental Impacts (minor emphasis)
Other Economic Impacts (minor emphasis)

Project Abstract:

The project's main focus is to monitor the impacts of the New Jersey Turnpike Authority's Value Pricing initiative, both at the system wide level and at the user level. The research team is interested, among other things, in assessing the behavioral changes as a consequence of the implementation of value pricing. In order to maximize the cost-effectiveness of the resources available to this investigation, the project team decided to study: (a) the impact of value pricing on the traffic of the entire New Jersey Turnpike; and (b) the behavioral impacts of value pricing on the users of the Northern part of the New Jersey Turnpike. This enables the project team to cover the entire length of the project and, at the same time, conduct advanced behavioral modeling on the most congested section of the NJTPk. The proposal has three main focus areas: *Descriptive Analyses*, *Behavioral Analyses* and *System Wide Impacts*. In each of these focus areas, different items will be analyzed and investigated.

1. Progress this quarter by task:

- Task 1: We continued to work on the possible questions for the focus groups and surveys.
- Task 3: We obtained complete 6 months data from NJTPK and completed the aggregate analysis of it.
- Task 4: We finished the aggregate data analysis. A draft working paper is completed. Now, we are analyzing the disaggregate car by car EZ Pass data provided to us by NJ Turnpike. This is a very time consuming task that requires substantial amount of computational resources.
- Task 5: Allan Lichtensten of TPI is working on a draft working paper.
- Task 6-7: Survey design is completed.
- Task 8-9: We will work on this task further after we get the results of survey data.
- Task 10: We continued to build the NJTPk and the network around the NJTPk for the traffic modeling.
- Task 11: We continued to work on modeling the travel benefits. This will be fed into Task 10.
- Tasks 13 and 14: We continued to work on a value of time model that will be used to quantify the economic value of travel time savings in these tasks.

2. Proposed activities for next quarter by task

- Continue to work on all the unfinished tasks
- Complete the surveys.
- Work on the behavioral and traffic model to assess the impacts of value pricing.
- Complete the traffic modeling.

3. List of deliverables provided in this quarter by task (product date)

Draft working paper on aggregate traffic data analysis.
Draft working paper on traffic modeling.
Final surveys.

4. Progress on Implementation and Training Activities

5. Problems/Proposed Solutions

Surveys are delayed but now the survey instrument is completely designed and surveys will be conducted in June.

Total Project Budget	$ 477,468.00
Modified Contract Amount:	
Total Project Expenditure to date	$202,040
% of Total Project Budget Expended	42%

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NJDOT Bureau of Research
QUARTERLY PROGRESS REPORT

Project Title:	Evaluation of Poisson's Ratio
RFP NUMBER:	NJDOT RESEARCH PROJECT MANAGER: Mr. Anthony Chmiel
TASK ORDER NUMBER/Study Number: Task Order No. 128 / 4-26531	PRINCIPAL INVESTIGATOR: Thomas Bennert
Project Starting Date: 1/01/2004 **Original** Project Ending Date: 12/31/2005 **Modified Completion Date: 12/31/2006**	Period Covered: 2nd Quarter 2004

Task	% of Total	% of Task this quarter	% of Task to date	% of Total Complete
Literature Search/Sensitivity Analysis	10%	50%	100%	10%
1. Material Collection	5%	0%	100%	5%
2. Laboratory Testing	65%	5%	45%	29.25%
3. Calibration	10%	10%	35%	3.5%
4. Reporting	10%	0%	0%	0%
Final Report				
TOTAL	100%			47.75%

Project Objectives:

- Conduct a sensitivity analysis to evaluate how the changing of the Poisson's Ratio affects the stresses and strains determined using elastic layer analysis procedures
- Evaluate the measurement of the Poisson's Ratio for aggregate base materials during the resilient modulus test and compare to available prediction equations
- Evaluate the measurement of the Poisson's Ratio for HMA materials during the dynamic modulus test and compare to available prediction equations

Project Abstract:

For the upcoming AASHTO Mechanistic Design Guide, the two main parameters needed for predicting the pavement stresses and strains are the modulus and the Poisson's Ratio. At the moment, the Poisson's Ratio is estimated based on the modulus of the material (both aggregate and HMA) or by the HMA temperature. However, this was developed using a minimal amount of material that does not represent the commonly used materials of New Jersey. Therefore, a research effort was developed to evaluate the current prediction methods and, if applicable, modify them to provide values that more closely represent materials from New Jersey.

1. Progress this quarter by task:

Twelve new samples were mixed, compacted, cored and cut to be tested under the dynamic modulus testing specification. The samples are comprised of a 12.5mm Superpave mix (on the coarse side) and utilize asphalt binders of PG64-22 and PG76-22, respectively. The samples were compacted to specifically evaluate the effect of air voids. Three samples of each mix were compacted to 2.5% (+/- 0.5%) and 7% (+/- 0.5%) air voids. The samples are scheduled to be tested in the upcoming weeks.

A sensitivity analysis was conducted using the derived Poisson's Ratio developed during the initial phases of testing. The modulus values, and their corresponding Poisson's Ratio values, were inputted into an elastic layer program (EVERSTRESS) to evaluate the stresses and strains developed by a 9,000 lb wheel load. The testing utilized dynamic modulus values that corresponded to seasonal changes in the air temperature. Preliminary results indicated that the use of the different prediction equations caused changes (sometimes doubled) in the measured

stresses and strains in the HMA pavement section. In fact, the results also indicated a change in the stresses at the top of the base layer. The results will be further analyzed and presented at the quarterly meeting.

2. Proposed activities for next quarter by task:

Testing to evaluate the effect of air voids on the measured Poisson's Ratio will be conducted. Samples will also be produced to evaluate the effect of asphalt binder content. The identical mix will be used with the asphalt content change +0.5% and -0.5%.

3. List of deliverables provided in this quarter by task (product date):

N.A.

4. Progress on Implementation and Training Activities:

N.A.

5. Problems/Proposed Solutions:

N.A.

Total Project Budget	$426,111
Modified Contract Amount:	
Total Project Expenditure to date	$165,601
% of Total Project Budget Expended	39%

* These are approximate expended amounts for the project; these estimates are for reference only and should not be used for official accounting purposes. For a more accurate project accounting please review the quarterly invoice for this project.

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NJDOT Bureau of Research
QUARTERLY PROGRESS REPORT

Project Title:	Ride Quality Follow-Up
RFP NUMBER: 2002-23	NJDOT RESEARCH PROJECT MANAGER: W. Lad Szalaj
TASK ORDER NUMBER: 126 / 4-26526	PRINCIPAL INVESTIGATOR: Dr. Nenad Gucunski
Project Starting Date: 1/01/2003 **Original** Project Ending Date: 12/31/2004 **Modified Completion Date:**	Period Covered: 2nd Quarter 2004

Task	% of Total	% of Task this quarter	% of Task to date	% of Total Complete
Literature Search and Planning	5	0	100	5
1. Design and Development	70	30	90	63
2. Implementation and Training	10	0	0	0
Final Report	10	0	0	0
TOTAL	100%			68

Project Objectives:

- Selection of a Standard Pavement Profiler (SPP), which will be used as NJDOT's official and standard device to establish the "true" pavement profile for calibration purposes,
- Replacing the currently used Percent Defective Length (%DL) statistic with a more representative ride statistic in calculating bonuses and penalties for contractors, and in representing the user opinion.
- Tabulating equipment characteristics of selected profile measuring devices,
- Developing procedures for calibrating NJDOT's ARAN device and selected profiling devices for use by contractors for quality control,
- Developing procedures for correlating the NJDOT SPP, the NJDOT ARAN and other profilers for QA/QC purposes,
- Development or evaluation of a standard software which will be used to process file data for calculation of accepted ride statistic for use on new and rehabilitated pavement projects, and
- Comparison, verification and testing the software with output from the profile equipment manufacturer.

Project Abstract:

This project is a follow-up of a study conducted by NJDOT Bureau of Research to evaluate the applicability of using automated highway profilers to replace the Rolling Straightedges (RSE) currently used by NJDOT to implement the department's smoothness specifications. The study recommended that NJDOT select an automated profiler to replace the RSE as its official and standard smoothness measuring equipment, and correlation models developed to calibrate other profilers with the standard profiler. It was recommended to select an indicator that better represents ride statistic as compared to using %DL or IRI.

The present project is aimed for carrying out further research to develop new acceptance specifications for improving QA/QC practice of evaluating pavement smoothness. This will involve replacing the presently used RSE device with a standard automated highway profiler and the use of a new ride statistic, which gives better representation of the actual pavement smoothness. The new statistic can then be used for calculating contractor bonuses and penalties as opposed to the current practice of using %DL.

The approach undertaken in the previous RSE study is being implemented in the present project. The project will be completed in four phases:

- Phase I (Literature Search and Planning) involves a comprehensive literature review, and presentation of findings to RPSIP for discussions and comments. Changes to the proposed work plan based on comments received will be made if required.
- Phase II (Design and Development) involves field data collection for selection of the standard pavement profiler (SPP), analysis of data for calibration and correlation of selected profilers and ARAN using SPP, development of a more representative ride statistic and software development or evaluation of existing software packages.
- Phase III (Implementation and Training) involves presentation of the findings of the research study, its implementation and for training in the use/operation of the correlation and calibration procedure and software developed as part of this study.
- In Phase IV (Reporting) the Final Report and Technical Brief will be submitted for review and comments by the RPSIP. If appropriate, a Research Needs Statement will be produced as a deliverable. This would identify the need for, and the scope of, further study and evaluation of the selected NJDOT Standard Pavement Profiler.

1. Progress this quarter by task:
   - Field tests using all profiling devices (NJDOT ARAN, Dynatest, Stantec ICC, Walking Profiler and Rod & Level)have been completed on two of the selected sites (NJ55 and I-195). Testing on the last site, NJ 18, still needs to be completed by ARAN and Walking profiler.
   - Analysis of the collected field data is in progress.
   - Development of pavement smoothness criteria and pavement roughness "diagnostic" tools will be completed by July of 2004. Two selected criteria, absolute and relative measures of smoothness, describe the roughness of the pavement profile and severity of a vehicle response, respectively. Both are based on the intensity of corresponding spectral functions. The "diagnostic" tool involves use of discrete and continuous wavelet transforms in presentation of the pavement profile and the vehicle response. The criteria and diagnostic tools implicitly consider, or allow detection of, the following factors:
     - Detection of repeated waves of wavelength affecting the ride quality,
     - Effects of the type and speed of the vehicle on user opinion,
     - Effects of roughness on the magnitude of dynamic forces induced on the pavement and cause damage, etc.

2. Proposed activities for next quarter by task:
   - Testing with ICC Laser Profilometer and Dynatest Road Surface Profiler
   - Development of a more representative ride statistics for use on new and rehabilitated pavement projects
   - Software review and evaluation, software development

3. List of deliverables provided in this quarter by task (product date):

4. Progress on Implementation and Training Activities:
   N/A

5. Problems/Proposed Solutions:
   N/A

Total Project Budget	$310,487
Modified Contract Amount:	
Total Project Expenditure to date	$149,280
% of Total Project Budget Expended	48%

* These are approximate expended amounts for the project; these estimates are for reference only and should not be used for official accounting purposes. For a more accurate project accounting please review the quarterly invoice for this project.

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NJDOT Bureau of Research
QUARTERLY PROGRESS REPORT

Project Title:	Monitoring of Construction Doremus Avenue Bridge Structure
RFP NUMBER: N/A	NJDOT RESEARCH PROJECT MANAGER: W. Lad Szalaj
TASK ORDER NUMBER: 99 / 4-26676	PRINCIPAL INVESTIGATOR: Hani Nassif
Project Starting Date: 01/01/2001 **Original** Project Ending Date: 12/31/2004 **Modified Completion Date:**	Period Covered: 2nd Quarter 2004

Task	% of Total	% of Task this quarter	% of Task to date	% of Total Complete
Literature Search	2%	0%	100%	2%
1. Finite Element Model Development and verification (Substructure & Superstructure)	5%	0%	90%	4.5%
2. Develop Instrumentation Plan and Install Sensors for LMC and Stage II sensors	20%	0%	100%	20%
3. Parametric Study	15%	0%	90%	13.5%
4. Perform Testing of LMC layers, Stage I and II before and After LMC, Monitoring and Data Collection	20%	5%	95%	19%
5. Prepare Recommendations to Modify AASHTO's, NJDOT's and LMC Procedures	20%	0%	70%	14%
6. Comparison of Analytical and Experimental Results including LMC layer	8%	5%	85%	6.8%
7. Progress Reports	5%	5%	95%	4.75%
Final Report	5%	0%	30%	1.5%
TOTAL	100%			86.05%

Project Objectives:

The Doremus Avenue bridge structure, located in Newark, NJ, is New Jersey's initial LRFD design. The construction project will involve replacement of an existing bridge structure that primarily carries truck traffic into the State's seaport area. The main objective of the overall five-year study is to instrument, monitor and evaluate the structure during and after construction. The evaluation process aims at assessing the new AASHTO LRFD design procedures and identifying what the New Jersey Department of Transportation (NJDOT) wishes to establish as future bridge design guidelines. The instrumentation schemes will be implemented during the construction phase. This will permit measuring the "undisturbed" behavior of the bridge and establishing the structure's "finger prints" prior to traffic opening. Both the superstructure and substructure will be instrumented and monitored simultaneously.

Project Abstract:

In 2002, the American Association of State Highway Transportation Officials (AASHTO) will adopt the Load and Resistance Factored Design (LRFD) Bridge Design Specifications as the standard by which all future bridge structures will be designed. The use of these Specifications will be mandatory for all States. New Jersey has committed to the adoption of the LRFD Specifications by January 2000. The LRFD Specifications considers the variability in the behavior of structural elements through the use of extensive statistical analyses to ascertain the behavioral variability. The LRFD Specifications continue to be refined and improved. However, many of the

Specifications' design approaches and methodologies have been adopted with limited or virtually no experimental validation. Therefore, there is a need to validate these new design procedures and models as well as to validate the integrity of LRFD designed bridge structures.

It is anticipated that the bridge will be instrumented to monitor its performance over a period of several years (5 years). It is also envisioned that the Doremus Avenue Bridge will act as a national "test bed" for verifying certain parameters of the AASHTO LRFD Bridge Design Specifications. The following sections describe the objective, scope, and tasks involved in developing analytical models and planning instrumentation schemes and sensor locations prior to the actual construction of the Doremus Ave. Bridge. The presented plan covers the first year of the project only. However, it is expected that the study will continue to allow for instrumentation, field-testing and long term monitoring. The overall project over the five-year period will consist of three Phases as follows:

- Phase I: Bridge Modeling, Instrumentation Planning, and Coordination of Tasks.
- Phase II: Bridge Instrumentation, Testing, and Verification prior to traffic opening.
- Phase III: Bridge Testing and long-term Monitoring after traffic opening.

1. Progress this quarter by task:
   A. Latex Modified Concrete Layer:
      1. Crack observation of LMC Layer. No cracks noted to date (visual inspection).
      2. Monitoring and Recording long term strain data.

   B. WIM System
      1. WIM system data is being downloaded on a regular basis for purposes of truck weights and classification beyond the scope of the fatigue system WIM record. The WIM software can automatically generate truck class and weight reports.
      2. Traffic statistical data: volumes, percent trucks, lane dist., weight distribution, speed can be generated.
      3. Data is being downloaded every two weeks by field visit.

   C. Fatigue System
      1. Pinpoint extremely heavy trucks with WIM data and plot strain record to verify. Some trucks in excess of 140k Class 9 have been recorded. These heavy trucks have generated up to 5ksi stresses in the girders. At least 1 heavy truck >140k occurs each day at Doremus Ave Bridge.
      2. Data is being downloaded every two weeks by field visit.

2. Proposed activities for next quarter by task:
      1. Long term monitoring of the stress and deflection of the bridge superstructures using VWSG and fatigue system as well as the truck load using the WIM system.
      2. Draft Repot.
      3. Establish a more efficient downloading procedure to minimize weekly site visits.

3. List of deliverables provided in this quarter by task (product date):
   N/A
4. Progress on Implementation and Training Activities:
   N/A
5. Problems/Proposed Solutions:
      1. Need telephone communication to download WIM data either using land line or cellular modem. This way it will minimize the amount of trips to the bridge to download data.

Total Project Budget	$914,150
Modified Contract Amount:	
Total Project Expenditure to date	$621,857
% of Total Project Budget Expended	68%

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NJDOT Bureau of Research
QUARTERLY PROGRESS REPORT

Project Title:	Instrumentation and Monitoring of Bridge Approach Slabs – Phase II
RFP NUMBER: N/A	NJDOT RESEARCH PROJECT MANAGER: W. Lad Szalaj
TASK ORDER NUMBER:	PRINCIPAL INVESTIGATOR: Hani Nassif
Project Starting Date: 1/1/2001 **Original** Project Ending Date: 12/31/2004 **Modified Completion Date:** 12/31/2004	Period Covered: 2nd Quarter 2004

Task	% of Total	% of Task this quarter	% of Task to date	% of Total Complete
Literature Search				
1. Instrumentation Plan and Field testing	30%	0%	100%	30%
2. Calibration of Sensors and DAS	20%	0%	100%	20%
3. Data collection and LTRM	20%	10%	90%	18%
4. FEM Verification	10%	5%	85%	8.5%
5. Progress Reports & Technical Memorandum	15%	5%	75%	11.25%
Final Report	5%	0%	0%	0%
TOTAL	100%			87.75%

Project Objectives:

To develop and specify new design method for bridge approach slab. The main objective of this study is to evaluate the cracking behavior of approach and transition slabs and the interaction between soil-slab-vehicle system. The scope of the study is as follows:

1. Develop a detailed 3-D finite element model that would incorporate the nonlinear and cracking behavior of reinforced concrete as well as the inelastic soil properties.
2. Compare results from the 3-D model with distress observed on actual structures
3. Perform a comparative parametric study to optimize the slab design.
4. Instrument and monitor the long-term performance for the newly designed and constructed approach and transition slabs on Doremus Avenue bridge project.

Project Abstract:

Bridge approach slabs provide a transitional roadway between pavement and the actual structure of the bridge. This transition is crucial in reducing the dynamic effects imposed on the bridge by traffic and truckloads. However, under the effect of heavy impact loads, coupled with unknown or inadequate soil conditions (e.g., settlement, embankment bulging, poor fill material, inadequate compaction, poor drainage, etc.), a number of approach slabs in the State of New Jersey have exhibited transverse structural cracking. This type of transverse cracking, as observed by site engineers of the New Jersey Department of Transportation (NJDOT) as well as the Rutgers Team, occurs even on relatively newly constructed slabs. Various design schemes of the approach and transition slabs (e.g. alteration of the thickness of the approach slab, adding number of rebars, increasing concrete strength, etc.) have been implemented, however, the structural cracking have persisted.

Despite the widespread occurrence of bridge approach problems, only a small number of research studies have been performed on the subject. Few studies have been developed for evaluating the cracking behavior of bridge approach slabs. However, this problem is becoming an increasingly important topic in the effort to deal with the deteriorating infrastructure and rehabilitation of roadways. Major decisions must be made to allocate the limited funds available for repair, rehabilitation and/or replacement on the basis of a detailed evaluation of the structural

integrity of bridge approach slabs. Therefore, there is a need for new design schemes that can ensure crack-free slabs and for the field monitoring their behavior under actual truck traffic.

1. Progress this quarter by task:
   - Long-term monitoring
   - Visual inspection for cracks and correlate cracks to strain data.
   - Provide final typical CAD drawing of the two approach slab designs (embedded beam and constant thickness)
   - Provide joint/dowels details between adjacent slabs.
   - Proved cost estimate between current to the proposed designs.
   - Examine the Victory Bridge site and provide instrumentation details for south approach slab.
   - Preliminary analysis of modified embedded beam bridge approach slab design

2. Proposed activities for next quarter by task:
   - Long-term monitoring using strain and visual inspection.
   - Visual monitoring of the Embedded Beam approach slab at Victory Bridge.
   - Instrumentation and monitoring of the Victory Bridge Approach Slabs.
   - Finite Element Modeling of the modified Embedded beam design slab

3. List of deliverables provided in this quarter by task (product date):
   N/A
4. Progress on Implementation and Training Activities:
   N/A
5. Problems/Proposed Solutions:
   N/A

Total Project Budget	NA add-on
Modified Contract Amount:	
Total Project Expenditure to date	NA add-on
% of Total Project Budget Expended	NA add-on

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NJDOT Bureau of Research
QUARTERLY PROGRESS REPORT

Project Title:	A Proposal for the Development of High Performances Concrete for Transportation Structures in New Jersey
RFP NUMBER: N/A	NJDOT RESEARCH PROJECT MANAGER: Tony Chmiel
TASK ORDER NUMBER: 62 / 4-23806	PRINCIPAL INVESTIGATOR: Hani Nassif
Project Starting Date: 04/30/2001 **Original** Project Ending Date: 2/1/2003 **Modified Completion Date:** 08/31/2003	Period Covered: 2nd Quarter 2004

Task	% of Total	% of Task this quarter	% of Task to date	% of Total Complete
Literature Search	5%	0%	100%	5%
1. Collection of Data and Preparation of Samples During the Field Samples	20%	0%	100%	20%
2. Evaluation of Field Samples	10%	0%	100%	10%
3. Creep and Shrinkage Set-up and Testing	50%	0%	100%	50%
4. Preparation of Specifications for HPC	10%	5%	100%	10%
Final Report	5%	0%	100%	5%
TOTAL	100%			100%

Project Objectives:

To develop high performance concrete mix design and specifications for transportation structures using resources readily available in New Jersey.

Project Abstract:

The primary objective of this research is to identify high performance concrete (HPC) mix proportions that are suitable for transportation infrastructure in New Jersey. Two classes of concrete with compressive strengths ranging from 6 to 12 ksi are developed. Extensive information is available in the literature covering various aspects of HPC. Show case projects have been built in a number of northeast states including New Hampshire and Virginia. The research plan involves: (i) review of existing information, (ii) selection of mix proportions suitable for New Jersey using local aggregates and the proportions in Class A concrete, (iii) evaluation of trial mixes prepared in the laboratory and at least one ready-mix industry, (iv) evaluation of mechanical and long-term properties, and (v) preparation of specifications for the implementation of HPC in future projects.

1. Progress this quarter by task:
   - Final report completed.
2. Proposed activities for next quarter by task:
   N/A
3. List of deliverables provided in this quarter by task (product date):
   N/A
4. Progress on Implementation and Training Activities:
   N/A
5. Problems/Proposed Solutions:
   N/A

Total Project Budget	$384,320.00
Modified Contract Amount:	
Total Project Expenditure to date	$384,320
% of Total Project Budget Expended	100%

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NJDOT Bureau of Research
QUARTERLY PROGRESS REPORT

Project Title:	Seismic Analysis of Retaining Walls, Buried Structures, Embankments, and Integral Abutments
RFP NUMBER: 2000-25	NJDOT RESEARCH PROJECT MANAGER: Mr. Anthony Chmiel
TASK ORDER NUMBER: 127 / 4-26995	PRINCIPAL INVESTIGATOR: Dr. Husam Najm
Project Starting Date: 01/01/2003 **Original** Project Ending Date: : 12/31/2003 **Modified Completion Date:** : 12/31/2004	Period Covered: 2nd Quarter 2004

Task	% of Total	% of Task this quarter	% of Task to date	% of Total Complete
1. Literature Review on Seismic Design of Abutments, Retaining Structures, Buried Structures, and Embankments	10	5	90	9
2. Provide Analysis, Design, and Detailing of Free Standing Abut and Retaining Walls	20	15	75	15
3. Provide Analysis, Design, and Detailing of Integral (Diaphragm) Abutments	20	20	80	16
4. Provide Guide Specifications Manual to assist Designers in Designing Free-Standing and Integral Abutments, Embankments, Buried Structures and Retaining Walls	30	10	70	21
5. Prepare Progress reports	10	20	70	7
6. Final Report and Technical Memos	10	20	70	7
TOTAL	100%	14	75	75

Project Objectives: 1) Perform comprehensive review of new seismic design guidelines proposed in NCHRP 12-49; 2) Provide guidelines for seismic design of seat types abutments, integral abutments, retaining walls, and buried structures; 3) Provide analysis, design, procedures of these structures with examples based on new provisions; and 4) provide specifications for the seismic design of these structures in NJ consistent with new LRFD general seismic design criteria

Project Abstract: Current LRFD provisions are based on seismic design criteria and detailing provisions that are at least 10 to 20 years old. These provisions are mostly based on the Division I-A Seismic Design of the AASHTO Standard Specifications (1996) and NEHRP (1997). NCHRP Project 12-49 was initiated to address the inadequate performance of highway bridges in recent earthquakes and the deficiencies in the current seismic code. NCHRP Project 12-49 is intended to develop comprehensive specifications for seismic design of bridges considering all aspects of the design process including: (1) design philosophy and performance criteria, (2) seismic loads and site effects, (3) analysis and modeling, (4) design requirements, and (5) detailing. These new specifications will be nationally applicable with provisions for all seismic zones. In the area of foundation design, the NCHRP 12-49 provisions are essentially an update of the existing AASHTO LRFD provisions, incorporating both current practice and recent research results including additional specific guidance on spring constants for spread footings, deep foundations, and integral abutments. Because of the several significant changes in the design criteria and approach provided in the new provisions, there are questions on how these new provisions will affect the design and performance of bridge in states nationwide as well as the retrofit of existing bridges. There are also questions on the impact of new provisions on the design of abutments and retaining walls. Hence, there was a need to evaluate the impact of the new seismic design provisions proposed in NCHRP Report 12-49 on the seismic design and detailing of bridges in New Jersey. Two examples will be designed based on the new NCHRP provisions. Soil factors will be

evaluated and compared to current data base of site-specific spectra, and guide specifications for seismic design of bridges and buried structures in NJ will be developed consistent with the new guidelines.

1. Progress this quarter by task: Only few data were received from Consultants regarding site-specific response spectra. These spectra were compared with NCHRP 12-49 spectra. An example of a curved bridge was added to compare NCHRP and LRFD provisions. Still working on design aids for typical bridges based in SDAP C.

2. Proposed activities for next quarter by task: Continue to collect response spectra data and continue on working to compare collected spectra versus those predicted by NCHRP 12-49. Continue to finalize those design aids for typical bridges based on SDAP C. PB will have a draft of their design examples with details and guidelines. Prepare a draft of the final report.

3. List of deliverables provided in this quarter by task (product date): Comparison between site-specific spectra and NCHRP 12-49.

4. Progress on Implementation and Training Activities: Preparing a journal paper for the ASCE JBE (Journal of Bridge Engineering on design guidelines for SDAP C, which is applicable for most bridges.

5. Problems/Proposed Solutions:

Total Project Budget	$173,017
Modified Contract Amount:	
Total Project Expenditure to date	$105,081
% of Total Project Budget Expended	61%

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NJDOT Bureau of Research
QUARTERLY PROGRESS REPORT

Project Title:	New Jersey State LTAP Technology Transfer Center
RFP NUMBER: 2004-	NJDOT RESEARCH PROJECT MANAGER: W. Lad Szalaj
TASK ORDER NUMBER: 149	PRINCIPAL INVESTIGATOR: Dr. Ali Maher
Project Starting Date: 01/01/2004 **Original** Project Ending Date: 12/31/2004 **Modified Completion Date:**	Period Covered: 2nd Quarter 2004

Task	% of Total	% of Task this quarter	% of Task to date	% of Total Complete
Activity				
1. Compile and Maintain Mail List	1.88	30	95	1.79
2. Publish Monthly Newsletter	10.30	25	50	5.15
3. Distribute Technology Transfer Materials	15.45	30	50	7.73
4. Provide Technical Assistance	34.25	20	40	13.7
5. Provide Training	33.31	40	65	21.65
6. Evaluate Effectiveness of Program	4.81	25	37	1.78
Final Report				
TOTAL	**100**			51.8

Project Objectives:

The Local Technical Assistance Program (LTAP) seeks to conduct several tasks that will promote best practices and implement state-of-the-art technologies to county and municipal transportation agencies. These activities include training, materials distribution, newsletter publication, technical assistance, and program evaluation. The objectives of this project are to continue to diversify and expand the customer base, deliver quality customer service, communicate the program values to partners and clients, and enhance the technology transfer network, through the activities of the Local Technical Assistance Program (LTAP).

Project Abstract:

The Local Technical Assistance Program (LTAP) will maintain mailing lists, publish a monthly newsletter, provide technical assistance, provide training, and evaluate the effectiveness of the program on an ongoing basis throughout the project.

The anticipated results are the creation of a library special collection made available on the LTAP website, monthly newsletter publication, an updated fax/e-mail directory for the transportation field, expanded training programs and additional conferences, and increased involvement with pertinent professional organizations.

1. Progress this quarter by task:

A. Compile and Maintain Mail List

The mail list database was updated to include the current 2004 data for New Jersey Municipal Engineering Departments and Public Works Departments (address, fax number and email if available), and Mayors (address). The attendees of the 2004 Roadway Management Conference were added to the database, for an additional 107 addresses and 107 emails.

B. Publish Monthly Newsletter

Approximately 3,600 individuals received each issue of the newsletter. Three issues of the newsletter were produced during this quarter. Electronic distribution of the newsletter occurred via e-mail. The newsletter is also available on the LTAP webpage: www.ltap.rutgers.edu and previous issues are archived inthe "newsletter" section of the webpage: http://www.ltap.rutgers.edu/newsletter/ .

Volume 6, Number 4 was publis hed in April 2004. The first edition of the quarter included updates on National Public Works Week, the 2004 Highway Engineering Exchange Program Conference, the 2nd National Movable Bridge Seminar, and upcoming events. The month's *Free for the Asking* offering was *Full Road Closure for Work Zone Operations* published by the Federal Highway Administration's Office of Safety.

Volume 6, Number 5 was published in May 2004. This issue featured articles on the new Transportation the passing of the new six year surface transportation bill, New Jersey Governor McGreevey's transportation conference, and upcoming events.Safety Resource Center at Rutgers University, This month's *Free for the Asking* offering was *Meeting the Customer's Needs for Mobility and Safety During Construction and Maintenance Operations: Model Work Zone Traffic Management Program and Self Evaluation Guide*, published by the Federal Highway Administration Office of Program Quality Coordination.

Volume 6, Number 6 was published in June 2004. The third issue of the quarter contained articles about the distances commuted by American workers, the 2004 graduates of the LTAP Center's Municipal Engineering Construction Inspection Program, and updated events. The *Free for the Asking* offering was the *Personal Protective Equipment OSHA Fact Sheet* published by the United States Department of Labor, Occupational Safety and Health Administration.

C. Distribute Technology Transfer Materials

579 technical publications were distributed during this quarter. Technology transfer materials were distributed during training seminars, workshops, and F*ree for the Asking* requests via the newsletter. In addition, specific requests made by customers included training videos and technical publications, which were duplicated and distributed.

D. Provide Technical Assistance

There were 217 instances of technical assistance provided by the LTAP staff. Requests were received via telephone, e-mail, mail, and fax.

E. Provide Training

Training has occurred this quarter in the following program areas: Municipal Engineering Construction Inspection Part Two, Road Scholar One, Road Scholar Two, Public Works Academy, two structural engineering conferences, and traffic engineering seminars. During this quarter, 679 individuals were trained via 18 programs.

F. Evaluate Effectiveness of Program

Program effectiveness was measured by use of course evaluations completed by participants at the end of each training program. Participants were asked to rate the overall quality of the course content, instructor, and presentation of the materials. Participants consistently rated the programs as having met or exceeded their expectations.

2. Proposed activities for next quarter by task:

A. Compile and Maintain Mail List

The mail list will be updated on an as needed basis.

B. Publish Monthly Newsletter

The newsletter will remain on a monthly publishing schedule.

C. Distribute Technology Transfer Materials

Technology transfer materials will be distributed during training programs, and by request. The lending library is always available.

D. Provide Technical Assistance

Technical assistance will be provided in response to any inquiries made via telephone, fax, or e-mail.

E. Provide Training

Training programs are scheduled for the next quarter as follows:

Road Scholar One Program
- Drainage Maintenance: The Key to Roads that Last
- Asphalt Roads: Common Maintenance Problems
- Hazards Associated with Fertilizers, Insecticides, and Herbicides
- Grounds Maintenance Safety
- Confined Space and Excavation Rescue
- Excavation and Trenching Safety
- Effective Incident Documentation
- Hazard Communications and Awareness

Road Scholar Two Program
- Shared Services and Privatization
- Managing Public Equipment
- Superior Performing Asphalt Pavements
- Crack Seal Repair

Conferences and Seminars
- Prefabricated Bridge Seminar
- Asset Management for Public Works

Public Works Academy
- Bergen County
- Mercer County

F. Evaluate Effectiveness of Program

Evaluations will continue to be distributed at each program. An Advisory Committee meeting will be held to review the project activities and progress.

3. List of deliverables provided in this quarter by task: (product date):

A. Compile and Maintain Mail List

Municipal Mayors Database	April 2004
Municipal Engineering Departments	April 2004
Roadway Management Conference Attendees	April 2004
Municipal Public Works Departments	May 2004

B. Publish Monthly Newsletter

Volume 6, Number 4	April 2004
Volume 6, Number 5	May 2004
Volume 6, Number 6	June 2004

C. Distribute Technology Transfer Materials	Ongoing
D. Provide Technical Assistance	Ongoing

E. Provide Training

Incident Command Systems for Public Works	April 6-8, 2004
Shared Services and Privatization	April 14, 2004
Managing Public Equipment	April 14, 2004
Personal Injury Prevention Techniques	April 21, 2004
Public Works: Terrorism/Weapons of Mass Destruction	April 27-29, 2004
Collision Avoidance Systems	May 5, 2004
National Movable Bridge Seminar	May 11-12, 2004
Pavement Maintenance: Crack Treatment Seminar	May 20, 2004
Winter Maintenance	May 26, 2004

Preventive Maintenance	May 26, 2004
LRFD Bridge Workshop	June 8, 2004
LTAP Region One Meeting	June 14-16, 2004
Successful Budgeting for Public Works	June 16, 2004
Grant Writing for Municipal Governments	June 16, 2004
Superior Performing Asphalt Pavements	June 17, 2004
Public Works Academy	June 22-24, 2004
Hot Mix Asphalt Resurfacing	June 29, 2004
Low Cost Surface Rehabilitation	June 29, 2004

F. Evaluate Effectiveness of Program — Ongoing

4. Progress on Implementation and Training Activities:

All of the activities of this technology transfer project, and their implementation dates are included above.

5. Problems/Proposed Solutions:

The Task Order for this project was received in early May.

Total Project Budget	415,000
Modified Contract Amount:	
Total Project Expenditure to date	
% of Total Project Budget Expended	

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CAIT
Center for Advanced Infrastructure & Transportation
Rutgers, The State University of New Jersey

NJDOT Bureau of Research
QUARTERLY PROGRESS REPORT

Project Title:	New Jersey Local Congestion, Safety, & Security Initiative
RFP NUMBER:	NJDOT RESEARCH PROJECT MANAGER: Nazhat Aboobaker/ Patty Leech
TASK ORDER NUMBER: Task Order No. 132/4-26993	PRINCIPAL INVESTIGATOR: Ali Maher/Joe Orth/Claudia Knezek/Carol Greenberg
Project Starting Date: 12/11/2002 **Original** Project Ending Date:12/11/2004 **Modified Completion Date:**	Period Covered: 2nd Quarter, 2004

Task	% of Total	% of Task this quarter	% of Task to date	% of Total Complete
1.1 MPO Forum Study	5	40	40	2
1.2 Present NJDOT/FHWA	5	0	0	0
2.1 Survey Report	20	100	100	20
3.1 Crash Data Training	10	20	20	2
3.2 Safety Conscious Planning Forum	10	100	100	10
3.3 SCP Local Forums	20	50	50	10
3.4 Official Conference Proceedings	5	0	0	0
3.5 Promote Congestion Mitigation Locally	10	10	10	1
3.6 Introduce ITS Concepts	5	100	100	5
3.7 Provide Public Safety Training	5	20	20	1
Final Report	5	25	25	1.25
TOTAL	100%			52.25%

Project Objectives: Rutgers CAIT-LTAP will facilitate a clearinghouse partnership between the FHWA-NJ Division, NJDOT, county, and local governments for the following purposes:

1. Promoting local best practices that relate to Safety Conscious Planning
2. Supporting Safety Awareness that results in the reduction of roadway fatalities, development of a uniform resource dissemination system, and the creation of a statewide SCP Forum Network
3. Introducing SCP that enables locals to collect more accurate traffic data for responding to critical safety needs.
4. Training municipalities on preventing crashes on local roadways.
5. Identifying roles of local governments in emergency preparedness, as it relates to Safety Conscious Planning.

Project Abstract: The New Jersey Congestion, Safety, and Security Initiative was developed to support the FHWA's "vital few" strategic goals on local roadways through the provision of training outreach, coordination of information dissemination, and the development of a statewide network that values roadway safety as a major priority. In New Jersey, traffic volumes have impacted the mobility and safe travel of motorists on the state, county, as well as local roadway systems. This widespread congestion has increased the number of crashes and incidents each year, which also affects security and incident management initiatives. The national Safety Conscious Planning Model is being implemented at all levels of govemment, in order to support the improvement of roadway safety. A statewide Safety Forum is being organized through the Metropolitan Planning Organizations with Rutgers CAIT-LTAP providing specialized training in the use of crash data and roadway inventories. These tools and other technologies have been effective for implementing cost effective countermeasure treatments that improve local roadways where nearly 50% of all crashes occur annually.

1. Progress this quarter by task:

Task	Description
1.1 MPO Forum Study	Preparation of the Forum Report
2.1 Survey Report	Municipal Data Collection has continued during this period. Sample has increased to 305 respondents (May 2004).
3.1 Crash Data Training	Participated in the following NJTR-1/Police Manual Meetings: 3/2/04 GIS/GPS Integration Meeting 3/16/04 - MMUCCs Integration 5/3/04 - Revision of NJTR-1 5/25/04 - Revision of NJTR-1
3.2 Safety Conscious Planning Forum	3/9/04 Forum Meeting 4/16/04 SCP Meeting 4/20/04 Transaction Presentation 5/5/04 Script Meeting 5/26/04 SCP Forum
3.5 Promote Congestion Mitigation Locally	3/17/04 – Work Zone Partnership Meeting 3/26-3/29 Life Savers Conference (Safe Communities) 4/1/04 - Work Zone Safety Conference
3.6 Introduce ITS Concepts	4/1/04 – Work Zone Safety Conference
3.7 Provide Public Safety Training	3/9-3/12 – Worker Safety Training 3/16-3/19 – TCC Training 4/6-4/9 – NJDOT TCC Training

2. Proposed activities for next quarter by task:

Task	Proposed Activities
1.1 MPO Forum Study 1.2 Present NJDOT/FHWA	Develop Statewide Database of Roadway Safety Organizations by County
3.1 Crash Data Training	Continue to review NJTR-1 & organize training
3.2 Safety Conscious Planning Forum	Develop Website Review for local use
3.3 SCP Local Forums	Organize Training Through Existing Active Programs (e.g. Police County Traffic Officers, So. Jersey Traffic Safety Alliance, Morris County Safety Committee, AAA) - Progress Distribute Safety Resources During Event
3.4 Official Conference Proceedings	Develop Promotional Publication of Local Best Practices
3.5 Promote Congestion Mitigation Locally	Incorporate into State & Local Best Practice Session at the Work Zone Safety Conference
3.6 Introduce ITS Concepts	4/1/04 – Work Zone Safety Awareness Conference
3.7 Provide Public Safety Training	4/7 & 4/8 – Sponsor MAST Regional Pavement Marking Retro-reflectivity Workshop September 2004 – Schedule Intersection Safety Workshop

Final Report	Integrate Results of Quarterly Reports into Final Format

3. List of deliverables provided in this quarter by task (product date):

Task	Deliverables	Item/Date
1.1 MPO Forum Study	LTAP Library of Publications	International Roadway Safety Day – CAIT-LTAP Newsletter (3/04) Safety Conscious Planning Comes to NJ (5/04) LTAP Resources (5/04)
2.1 Survey Report	LTAP Library of Publications	Municipal Data Collection has continued during this period. Sample has increased to 305 respondents (Transaction Presentation 4/04 & Forum Publication 5/04)
3.1 Crash Data Training	Distribute Technical Information Arranging Speaking Engagements	Participated in the following NJTR-1/Police Manual Meetings: 3/2/04 GIS/GPS Integration Meeting 3/16/04 - MMUCCs Integration 5/3/04 - Revision of NJTR-1 5/25/04 - Revision of NJTR-1
3.2 Safety Conscious Planning Forum	Statewide Forum (1) Local Symposiums (15) Distribution of Technical Information Arranging Speaking Engagements	3/9/04 Forum Meeting 4/16/04 SCP Meeting 4/20/04 Transaction Presentation 5/5/04 Script Meeting 5/26/04 SCP Forum
3.5 Promote Congestion Mitigation Locally	Distribution of Technical Information Arranging Speaking Engagements Identify the Roles of Transportation Agencies During Events Discuss Roles & Responsibilities of Locals after an Event	3/17/04 – Work Zone Partnership Meeting 3/26-3/29 Life Savers Conference (Safe Communities) 4/1/04 - Work Zone Safety Conference
3.6 Introduce ITS Concepts	Distribution of Technical Information Arranging Speaking Engagements Identify the Roles of Transportation Agencies During Events Discuss Roles & Responsibilities of Locals after an Event	4/1/04 Work Zone Safety Conference 4/7 & 4/8/04 Pavement Marking & Retro-reflectivity Regional Workshop

3.7 Provide Public Safety Training	Expanded list of subscribers Distribution of Technical Information Arranging Speaking Engagements Identify the Roles of Transportation Agencies During Events Discuss Roles & Responsibilities of Locals after an Event	3/9-3/12 – Worker Safety Training 3/16-3/19 – TCC Training 4/6-4/9 – NJDOT TCC Training

4. Progress on Implementation and Training Activities:

Training	Description
3.1 Crash Data Training	Participated in the following NJTR-1/Police Manual Meetings: 3/2/04 GIS/GPS Integration Meeting 3/16/04 - MMUCCs Integration 5/3/04 - Revision of NJTR-1 5/25/04 - Revision of NJTR-1
3.2 Safety Conscious Planning Forum	3/9/04 Forum Meeting 4/16/04 SCP Meeting 4/20/04 Transaction Presentation 5/5/04 Script Meeting 5/26/04 SCP Forum
3.7 Provide Public Safety Training	3/9-3/12 – Worker Safety Training 3/16-3/19 – TCC Training 4/6-4/9 – NJDOT TCC Training

5. Problems/Proposed Solutions: MPO Organizations have been working together to promote Safety Conscious Planning within their regions. NJTPA began offering local crash data analysis service for clients; however it is not as comprehensive as the project that Rutgers will build in conjunction with NJDOT. This group will also be hosting the statewide Safety Conscious Planning Forum in May.

Total Project Budget	$741,836
Modified Contract Amount:	$752,433
Total Project Expenditure to date	$580,889
% of Total Project Budget Expended	77%

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NJDOT Bureau of Research
QUARTERLY PROGRESS REPORT

Project Title:	The New Jersey Local Police Technical Assistance Program
RFP NUMBER: N/A	NJDOT/FHWA RESEARCH PROJECT MANAGER(S): Pat Ott
TASK ORDER NUMBER/Study Number: Task Order No. 143/ RU Hold Account	PRINCIPAL INVESTIGATOR: Ali Maher/Joe Orth/Claudia Knezek/Carol Greenberg
Study Start Date: December 1, 2003 Study End Date: December 1, 2005	Period Covered: Second Quarter 2004

Task	% of Total	% of Task this quarter	% of Task to date	% of Total Complete
1.0 Literature Search	20	50	50	10
1.1 Conduct research	10	50	50	5
2.0 Survey	5	50	50	2.5
2.1 Conduct Survey	5	50	50	2.5
3.0 Technical Assistance/Tech Transfer	10	0	0	0
3.1 Maintain Mail Lists	5	50	50	2.5
3.2 Publish Newsletter	10	0	0	0
3.3 Provide Technical Assistance	15	0	10	1.5
4.0 Provide Training	20	0	0	0
TOTAL	100			24 %

Project Objectives: The Police Technical Assistance Program (PTAP) is responsible for the following:

1. To provide a clearinghouse for law enforcement agencies to access information on advancements being made in the crash records field.
2. To showcase NJDOT methodologies, research, and technology initiatives in crash records systems.
3. To offer technical assistance to Local police departments.
4. To support the NJDOT's goal of reaching local government agencies through CAIT-LTAP technology transfer activities.

Project Abstract: There is a need for the FHWA vital few strategic goals to be introduced to local government through training outreach and distribution of resources. Accurate reporting, processing, and maintaining of crash data is a priority for NJDOT to develop effective solutions to traffic safety problems. Staff members of the NJ LTAP program will serve as representatives to the Safety Management Task Force and the Statewide Traffic Records Coordinating Committee (STRCC). Additionally, the LTAP staff members will facilitate quarterly local task force meetings for representatives from local law enforcement associations. The outcome of this program is to increase the accuracy of crash reports that are submitted to the NJDOT for inclusion in the statewide Crash Records Database.

1. **Progress this quarter by task:**

Task	Description
2.0 Survey	Police Traffic Officers have been responding to the Safety Survey on the availability of electronic data transfer.
2.1 Conduct Survey	CAIT-LTAP has received survey responses from Police Traffic Officers on Municipal Roadway Safety conditions.

2. **Proposed activities for next quarter by task:**

Task	Proposed Activities
1.0 Literature Search	The Literature Search will be focused on the best practices that exist on establishing crash records data collection systems.
1.1 Conduct Research	Rutgers will contact other states to determine the best practices for data collection and sharing of databases between state and local enforcement agencies.

3. **List of deliverables provided in this quarter by task (product date):**

Task	Description	Item/Date
2.0 Survey	Police Traffic Officers have been responding to the CSSI Survey on the local use of crash data	Over 305 surveys have been obtained from predominantly police traffic officers during the period of (3/2-6/1/04)
2.1 Conduct Survey	CAIT-LTAP has received survey responses from Police Traffic Officers on Municipal Roadway Safety conditions.	Over 305 surveys have been obtained from predominantly police traffic officers during the period of (3/2-6/1/04)

4. **Progress on Implementation and Training Activities:**

Training	Description
4.0 Provide Training	The NJTR-1 Committee will not be completed with the task of revising the form until late 2004, which means that workshops and program updates will not available until the beginning of 2005.

5. **Problems/Proposed Solutions:** The PTAP grant may need to be extended another year, reflecting January 1 through December 31st, so that training on the NJTR-1 revisions can be conducted. The project manager has recently been hired to administer this project and will organize the appropriate grant activities.

Total Project Budget	$285,725.00
Modified Contract Amount:	285,725.00
Total Project Expenditure to date	6,626.00
% of Total Project Budget Expended	3%

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QUARTERLY PROGRESS REPORT

Project Title:	Evaluation of Adaptive Control Strategies for NJ Highways
RFP NUMBER: N/A	NJDOT RESEARCH PROJECT MANAGER: Karl Brodtman
TASK ORDER NUMBER/Study Number: 101 / 4-26682	PRINCIPAL INVESTIGATOR: Kaan Ozbay
Study Start Date: 01/01/2001 Study End Date: 6/31/2004 No Cost Extension	Period Covered: 2nd Quarter 2004

Task	% of Total	% of Task this quarter	% of Task to date	% of Total Complete
Task 1: Literature Survey	10%	30%	100%	10%
Task 2: Inventory Assessment	25%	20%	100%	25%
Task 3: Site Selection	5%	0%	100%	5%
Task 4: DSS Development	35%	10%	100%	35%
Task 5: Gap Analysis	5%	80%	100%	5%
Task 6: Implementation Strategies	5%	20%	100%	5%
Task 7: Training	5%			
Progress Reports				
Final Report	10%	10%	80%	8%
TOTAL	100%			98%

1. The percentages were adjusted to reflect the work needed for each task.

PROJECT OBJECTIVES:
Develop a computer based prototype Decision Support System (DSS) for "evaluating adaptive traffic signal control systems" in New Jersey.

PROJECT ABSTRACT:
In order to achieve optimal selection of best candidate intersection(s) for implementing adaptive signal systems, a computer based prototype Decision Support System (DSS) that takes into account the heuristic nature and inherent uncertainties associated with the signalized intersections and traffic will be developed. This DSS will be an integrated GIS- Knowledge Based Expert System which combines expert system rules with simulation. Cost-Benefit analysis module that will provide the decision makers with final C/B ratios will also be part of the developed DSS.

1. Progress this quarter by task:
Draft final report is complete.
Final prototype decision support system is complete.

2. Proposed activities for next quarter by task

3. List of deliverables provided in this quarter by task (product date)
Draft final report.
Prototype decision support system and the Cost-Benefit analysis module.

Department of Civil and Environmental Engineering
623 Bowser Rd. Piscataway NJ 08854-8014
Tel: 732-445-0579 Fax: 732-445-0577

4. Progress on Implementation and Training Activities

5. Problems/Proposed Solutions

We had to make certain changes to the prototype decision support system to a selection feature to include multiple intersections and cost benefit analysis as part of the overall program.

Total Project Budget	$318,458.00
Modified Contract Amount:	No
Total Project Expenditure to date	$318,458
% of Total Project Budget Expended	100%

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NJDOT Bureau of Research
QUARTERLY PROGRESS REPORT

Project Title:	Demonstration Project – Beneficial use of Dredge Clay in Upland Sites
RFP NUMBER:	NJDOT RESEARCH PROJECT MANAGER: Michael Riley
TASK ORDER NUMBER: 139 / 4-29053	PRINCIPAL INVESTIGATOR: Dr. Ali Maher
Project Starting Date: 07/15/2003 **Original** Project Ending Date: 07/14/2004 **Modified Completion Date:**	Period Covered: 2nd Quarter 2004

Task	% of Total	% of Task this quarter	% of Task to date	% of Total Complete
1. Literature Search	2%	1%	2%	2%
2. Unloading and Transporting of Clay to Test Area	25%	100%	100%	25%
3. Placement of Clay According to Technical Specifications	20%	100%	100%	20%
4. Geotechnical Field and Laboratory Testing	25%	10%	90%	22.5%
5. Analysis of Potential Use	15%	10%	10%	10%
6. Cost Analysis	8%	4%	4%	4%
7. Final Report	5%	25%	50%	2.5%
TOTAL	100%			86%

Project Objectives:

Project Abstract:

1. Progress this quarter by task: Completion of 90% of Laboratory Testing

2. Proposed activities for next quarter by task: Completion of Field Work, Preparation of Draft Final Report

3. List of deliverables provided in this quarter by task (product date): Additional laboratory testing results and Interim Report.

4. Progress on Implementation and Training Activities:

5. Problems/Proposed Solutions:

Total Project Budget	1 Year	$348,064.00
Modified Contract Amount:		$348,064.00
Total Project Expenditure to date		$305,086
% of Total Project Budget Expended	Year 1 and 2	88%

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QUARTERLY PROGRESS REPORT

Project Title:	Engineering Management Consulting Services
RFP NUMBER: N/A	NJDOT/FHWA RESEARCH PROJECT MANAGER(S): Doreen Plummer
TASK ORDER NUMBER/Study Number: Task Order No. 124 / 4-26789	PRINCIPAL INVESTIGATOR: Ali Maher/Joe Orth/Pat Szary
Project Starting Date: 5-29-03 **Original** Project Ending Date: 5-28-05 **Modified Completion Date:**	Period Covered: 2nd Quarter 2004

Task
1.0 Partnering
2.0 Meeting Facilitation
3.0 Organizational Development Efforts
4.0 Industry Relations Facilitation
5.0 Task Forces Facilitation

Project Objectives: The purpose of this project is to manage experts in the areas of facilitation of departmental/industry/University initiatives, pre construction partnering, pre design partnering and public meeting facilitation, Engineering Unit strategic planning, and industry and University task force facilitation and deployment. These experts will provide Engineering Management Consulting Services to the NJDOT Capital Program

Project Abstract: The Capital Program Management Division of the New Jersey Department of Transportation requires that expert and experienced personnel participate in their projects. With the recent retirement of so many NJDOT personnel there exists a shortage of qualified individuals to facilitate the work.

The research plan to provide Engineering Management Consulting services to the Department of Transportation will include:

1. Facilitation of Departmental/Industry/University Initiatives: Examples include Bridge Footprint Program, Local Bridge Design Standards, Congestion Management, Pavement Management, Safety Management Systems
2. Pre Construction Partnering
3. Pre Design Partnering and public meeting facilitation
4. Engineering Unit strategic planning
5. Industry and University task force facilitation and deployment

The final product of this work will consist of providing the New Jersey Department of Transportation with the necessary experts to conduct engineering management consulting.

Department of Civil and Environmental Engineering
623 Bowser Rd. Piscataway, NJ 08854-8014
Tel: 732-445-0579 Fax: 732-445-0577

Progress this quarter by task:

1.0 Partnering
Route 9 Land Use Workshops (4/7, 4/15, 4/16, 4/27)
Exit 8A Partner Workshop for Congestion Buster (4/14)
Route 46 Construction Projects (4/21)
2.0 Meeting Facilitation
Traffic Mitigation Workshop Route 139 Holland Tunnel Entrance (4/19)
Logistics Council Meeting (6/21)
3.0 Organizational Development Efforts
Administration Retreat Strategic Planning and Retreat (4/5, 4/7, 4/29, 4/11)
Division of Environmental Resources Reorganization (4/29, 5/5, 6/17)
4.0 Industry Relations Facilitation
CIAP/DOT (5/18)
CEC Quarterly Meeting (5/18)
CIAP/DOT/Scholarship Collaboration (5/19)
Highway Engineers Exchange Program-DOT Host-Keynote Address (6/21)
5.0 Task Forces Facilitation
Federal Financial System Task Force (4/5, 4/8, 4/15, 4/22, 4/29, 5/6, 5/13, 5/20, 6/2, 6/10, 6/17, 6/24, 6/30)
Regional Alignment Task Force (5/10, 5/17, 5/18, 5/24, 6/7, 6/14, 6/21, 6/28)
Electronic Bidding and Construction Payment Task Force (4/21, 4/30, 5/14, 5/19, 5/28, 6/4)
Congestion Busters Implementation Team (4/7, 4/14, 4/28, 5/12, 6/15)
Logistics Council Task Force (4/6,6/25)

Proposed activities for next quarter by task

1.0 Partnering
Construction Partnering and Alternative Dispute Resolution
2.0 Meeting Facilitation
Traffic Mitigation
3.0 Organizational Development Efforts
Regional Alignment
Division of Environmental
Retreat Facilitation
4.0 Industry Relations Facilitation
CEC Meetings
CEC Debriefing of Selection Task Group
CIAP/DOT Industry Relationship
5.0 Task Forces Facilitation
Federal Financial System
Construction Financial Payment Bidding System
Logistics
Congestion Buster
Quick Fix

List of deliverables provided in this quarter by task (product date)

1.0 Partnering
Route 9 Land Use Workshops (4/7, 4/15, 4/16, 4/27)
Exit 8A Partner Workshop for Congestion Buster (4/14)
Route 46 Construction Projects (4/21)
2.0 Meeting Facilitation
Traffic Mitigation Workshop Route 139 Holland Tunnel Entrance (4/19)
Logistics Council Meeting (6/21)
3.0 Organizational Development Efforts
Administration Retreat Strategic Planning and Retreat (4/5, 4/7, 4/29, 4/11)
Division of Environmental Resources Reorganization (4/29, 5/5, 6/17)
4.0 Industry Relations Facilitation
CIAP/DOT (5/18)
CEC Quarterly Meeting (5/18)
CIAP/DOT/Scholarship Collaboration (5/19)
Highway Engineers Exchange Program-DOT Host-Keynote Address (6/21)
5.0 Task Forces Facilitation
Federal Financial System Task Force (4/5, 4/8, 4/15, 4/22, 4/29, 5/6, 5/13, 5/20, 6/2, 6/10, 6/17, 6/24, 6/30)
Regional Alignment Task Force (5/10, 5/17, 5/18, 5/24, 6/7, 6/14, 6/21, 6/28)
Electronic Bidding and Construction Payment Task Force (4/21, 4/30, 5/14, 5/19, 5/28, 6/4)
Congestion Busters Implementation Team (4/7, 4/14, 4/28, 5/12, 6/15)
Logistics Council Task Force (4/6,6/25)

Progress on Implementation and Training Activities
Not applicable.

Problems/Proposed Solutions
None at this time.

Total Project Budget	$50,000
Modified Contract Amount:	$100,000
Total Project Expenditure to date	$40,202
% of Total Project Budget Expended	40.2%

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Rutgers, The State University of New Jersey

QUARTERLY PROGRESS REPORT

Project Title:	New Jersey Interagency Emergency Management Plan
RFP NUMBER:	NJDOT/FHWA RESEARCH PROJECT MANAGER(S): Art Egan
TASK ORDER NUMBER/Study Number: Task Order No. 133 / 4-29000	PRINCIPAL INVESTIGATOR: Ali Maher/Joe Orth/Rod Roberson
Project Starting Date: 3/18/2003 **Original** Project Ending Date: 3/18/2005 **Modified Completion Date:**	Period Covered: 2nd Quarter 2004

Task	% of Total	% of Task this quarter	% of Task to date	% of Total Complete
Literature Search				
1.00 Identify NJDOT rep	2		100	2
1.01 Meet with Agencies	3		100	3
1.02 Meet Individual Agencies	10	10	100	10
1.1 Identify Current State of Practice	20	50	90	18
1.2 Make Presentation to NJDOT	5	65	100	5
LTAP Plan Concept				
2.0 Develop Recommendations	15	60	100	15
2.1 Options to accomplish Objectives	25	60	100	25
2.2 LTAP present findings	5		0	0
2.3 Develop Tasks	10		0	0
2.4 Present Plan	5		0	0
TOTAL	100			78%

Project Objectives:

1. To develop a team approach that incorporates state level public sector transportation resources and assets, including those owned and operated by New Jersey Transit, the Garden State Parkway, NJ Turnpike, and the Atlantic City Expressway, with those of the New Jersey Department of Transportation into an emergency management plan that meets or exceeds the goals of the State emergency management efforts.
2. To marry the resources of the multi-modal private sector transportation industry into the plan so as to allow for a combined public/private partnership/response.
3. To formally identify the Commissioner of Transportation as New Jersey's Transportation lead during all emergency operations.

Project Abstract: The need for ensuring mobility, function, and integrity of the State's transportation system during an emergency was realized during the tragedy of September 11, 2001 as well as during localized events such as the Rt. 80 Bridge fire and the associated damage from Hurricane Floyd. It is essential that New Jersey's multi-modal transportation network be kept in operation during an emergency.

A literature search will be conducted to determine the current state of practice of State and Federal agencies. This will be analyzed along with existing methods of sharing and communication among these agencies. Emergency planning issues prior, during, and after an incident will be addressed to identify roles and responsibilities of each agency.

Department of Civil and Environmental Engineering
623 Bowser Rd. Piscataway NJ 08854-8014
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This project will provide the Commissioner of the New Jersey Department of Transportation with a formalized emergency response plan that promotes unification of the efforts of all agencies, maximum utilization of combined resources, and involvement of the private sector transportation industry. The plan will incorporate viable protective measures and alternative actions, and will suggest ways to consolidate the planning, response, and recovery efforts of the Atlantic City Expressway, NJ Turnpike, Garden State Parkway, and the New Jersey Department of Transportation into one unified and effective transportation plan.

Progress this quarter by task:

1.02	Met with representatives of Michael Baker Corp. relative to their work at NJDOT on Straight Line Diagram (SLD) program and the features inventory for the Maintenance Management System (MMS)
1.1	Met with Richard Shaw, Director of Operations Support, NJDOT to discuss issues of staffing, training and maintenance of the MMS
1.2	Met with Commissioner Lettiere relative to final interim report delivered to him on May 3
2.0	Met with Arthur Egan, Mgr. of NJDOT Emergency Management Unit to discuss development of an implementation plan for project recommendations
2.1	Met with Kurt Aufschneider, Director Traffic Operations, NJDOT to discuss implementation of recommendations contained in interim report
2.1	Met with Art Eagen & Dave Bowlby of NJDOT relative to conducting a pilot program for vulnerability assessment

Proposed activities for next quarter by task:

1.1	Implementation of a full program of infrastructure assessment for all state level routes
2.3	Continue meeting with other consultants to insure that our project complies with the IT Architecture that NJDOT is exploring for statewide implementation
2.3	Continue work on systems integration between MMS, SLD and other identified systems
2.4	Develop and present to the Commissioner an implementation plan for the recommendation contained in the interim report

List of deliverables provided in this quarter by task (product date):

1.1	Custom designed forms for use in conducting infrastructure assessment
1.2	Presented final interim report to Commissioner Lettiere (5/3/04)

Progress on Implementation and Training Activities:

Plans are being formulated to train the staff of the NJDOT Emergency Management Unit on methodology of using the custom designed forms (task 1.1) to conduct the infrastructure assessment

Problems/Proposed Solutions:

.

None at this time.

Total Project Budget	$139,150
Modified Contract Amount:	$139,150
Total Project Expenditure to Date	$46,969
% of Total Project Budget Expended	33.75%

These are approximate expended amounts for the project; these estimates are for reference only and should not be used for official accounting purposes. For a more accurate project accounting please review the quarterly invoice for this project.

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NJDOT Bureau of Research
QUARTERLY PROGRESS REPORT

Project Title:	Demonstration Project – The Measurement of Pavement Noise Using the NCAT Noise Trailer
RFP NUMBER:	NJDOT RESEARCH PROJECT MANAGER: Mr. W. Lad Szalaj
TASK ORDER NUMBER: 140 / 4-29052	PRINCIPAL INVESTIGATOR: Thomas Bennert
Project Starting Date: 8/1/2003 **Original** Project Ending Date: 12/31/2003 **Modified Completion Date: 6/30/2004**	Period Covered: 2nd Quarter 2004

Task	% of Total	% of Task this quarter	% of Task to date	% of Total Complete
Literature Search				
1. Pavement Type Selection	10%	100%	100%	10%
2. Pavement Noise Testing	70%	100%	100%	70%
3. Data Analysis and Reporting	20%	100%	100%	20%
Final Report				
TOTAL	100%			100%
TOTAL	100%			

Project Objectives:

- To evaluate the use of the NCAT Noise Trailer as a means of providing repeatability values of tire/pavement related noise
- To provide the NJDOT with an initial database of typical tire/pavement noise for different pavement surfaces in New Jersey
- To evaluate the affect of vehicle speed on the magnitude of tire/pavement related noise

Project Abstract:

A demonstration project was conducted for the New Jersey Department of Transportation (NJDOT) to evaluate the measurement of pavement/tire noise on New Jersey pavements. The pavement/tire noise is defined as the noise directly produced by the tire traveling over the pavement surface. It does not consider other traffic-related noise such as automobile/truck engines, braking, etc. This is important since the only factor the NJDOT can truly control to aid in the traffic noise reduction is the pavement surface.

The demonstration project was developed to provide two key pieces of information: 1) An evaluation of the NCAT Noise Trailer as a means of measuring pavement/tire related noise, and 2) To develop an initial database of noise values for different pavement surfaces that are typically encountered on New Jersey highways.

The NCAT (National Center for Asphalt Technology) Noise Trailer uses the Close-Proximity Method (CPX) to measure the pavement/tire noise. In this method, microphones are placed near the pavement/tire interface to directly measure the pavement/tire noise levels. The microphone set-up and tires are enclosed in a chamber that is insulated with noise absorbing insulation. This provides an enclosure that is only measuring the noise developed by the pavement/tire interface and not any external noise of the passing vehicles or environment.

The NCAT Noise Trailer was evaluated for repeatability and also to evaluate the effect of traffic speed on the pavement/tire noise. Results of the testing showed the repeatability to be quite consistent, with the average standard deviation to be 0.15 decibels, as long as the test section is greater than 0.1 miles. The standard deviation proved to increase when the test section was less than 0.1 miles, such as for bridge decks. The effect of traffic speed was evaluated by testing the same pavement section at three different speeds; 55, 60, and 65 mph. The results indicated that the 55 mph speed produced the lowest pavement/tire noise and that it can be assumed that the noise increases linearly (at least within this range of traffic speed).

The NCAT Noise Trailer was also used to develop an initial database of pavement/tire noise levels for different pavement surfaces tested. In general, the Portland Concrete (PCC) sections produced the loudest pavement surface while the Open-graded Friction Course (OGFC) produced the lowest pavement/tire noise.

1. Progress this quarter by task:

The corrections to the final report were completed and the revised final report was submitted. The results generated with the data collected from the study is currently being evaluated, along with wet skid numbers to provide NJDOT engineers guidance in selecting quieter and safer surface course materials.

2. Proposed activities for next quarter by task:

N.A.

3. List of deliverables provided in this quarter by task (product date):

N.A.

4. Progress on Implementation and Training Activities:

N.A.

5. Problems/Proposed Solutions:

N.A.

Total Project Budget	$15,000
Modified Contract Amount:	
Total Project Expenditure to date	$13,928
% of Total Project Budget Expended	93%

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NJDOT Bureau of Research
QUARTERLY PROGRESS REPORT

Project Title:	Use of Windows-based PDAs for Paperless Operation of Emergency Management Team
RFP NUMBER:	NJDOT RESEARCH PROJECT MANAGER: Stan Worosz
TASK ORDER NUMBER/Study Number: Task Order No. 138/4-29091	PRINCIPAL INVESTIGATOR: Dr. Trefor Williams/Dr. Izzat Bakhadyrov/Joe Orth
Project Starting Date: 12/15/2003 **Original** Project Ending Date: 12/15/2004 **Modified Completion Date:**	Period Covered: 2nd Quarter 2004

Task	% of Total	% of Task this quarter	% of Task to date	% of Total Complete
1. Technology Review	10		100	10
2. Specifications				
2.01 Business Requirements	10	10	100	10
2.02 Functional Requirements	5	100	100	5
2.03 Design Specifications	5	100	100	5
3. Coding and Development	30	50	50	15
4. Debugging	10	10	10	1
5. On-Field Testing	10			
6. Training	10			
7 Deployment	10			
TOTAL	100%			46%

Project Objectives: To research and develop a paperless data collection system for New Jersey Traffic Operations South's Emergency Service Program and provide application software to transfer field collected incident data to the central database of New Jersey DOT Operations.

Project Abstract: The New Jersey Department of Transportation (NJDOT) Operations has an immediate need for efficient paperless case data entry solutions for their Emergency Service Providers (ESP's) personnel. The ESP personnel patrol designated areas throughout the State for the purpose of performing emergency services for motorists encountering minor and major accidents or incidents. At each accident scene or incident, a case description form is filled out by the ESP team, which includes data on motorist vital information, road conditions, etc. Currently, the form that is used by the ESP team is paper-based and is submitted at the end of the work shift. The data entry operator then enters this information into the central database, where the information is collected for further analysis. The use of paper forms creates an unnecessary workload for database operators. Also, this substantial number of forms (about 400/day) exceeds the data entry capabilities of the departmental database operators, thus creating significant backlogs and delays.

This project will be divided into three main stages:

I. **Environment and Technology Research.** At this stage, NJDOT Operations ESP structures (organizational, geographical, information, etc.) will be studied along with the survey of current state-of-the art in PDA technology. The PDA-based system will be developed from the results of investigations, surveys, field reviews, and departmental recommendations regarding the improvement of existing operational and information exchange procedures. Additionally, the findings will be further adapted to the detailed specifications of hardware and software for PDA system.

II. **Development.** At this stage, custom PDA and server software will be developed, based on requirements produced in Stage I. A Pilot program, involving 1-3 PDA's will be executed with select ESP team members to test the efficiency of the developed system and improve it, if necessary.

III. **Deployment and Training.** Upon completion of Stage II. ESP incident reporting will be migrated to the new PDA-based paperless system. Training will be provided to ESPs in order to demonstrate the use the PDA-based system. Optionally, training will be provided to designated personnel who are responsible for the maintenance and troubleshooting of the PDA-based system, as it interfaces with the central server.

Development of this hardware/software solution will utilize Windows-based PDAs to enter and store ESP incident forms in an electronic format. This will dramatically reduce the workload for database operators and provide a paperless operation for ESP personnel. This system would include the capability of easy submission of forms directly or indirectly into the central database, thus increasing the efficiency of the Division and eliminating the manual entry of information into the central database.

1. Progress this quarter by task:

1.0	A)Technology Review expanded to include 2 additional protective cases B) Demonstration of these cases to NJDOT customer
2.01	Additional information gathered for Business Requirements/Reporting
2.01.1	Business Requirements completed
2.02	Functional Requirements completed
2.03	Design Specifications completed
3.0	Coding/Development started
4.0	Debugging started

2. Proposed activities for next quarter by task:

3.0	Complete Coding and Development
4.0	Complete Debugging
5.0	Field Testing

3. List of deliverables provided in this quarter by task (product date):

2.1	Business/User Requirements Document (May 14, 2004)
2.2	Functional/Software Requirements Document (May 14, 2004)

4. Progress on Implementation and Training Activities:

Not at implementation

5. Problems/Proposed Solutions:

None at this time

Total Project Budget	$98,395.00
Modified Contract Amount:	98395.00
Total Project Expenditure to date	$5101.00
% of Total Project Budget Expended	5.18%

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NJDOT Bureau of Research
QUARTERLY PROGRESS REPORT

Project Title:	The Development of a Performance Specification for Granular Base and Subbase Material
RFP NUMBER:	NJDOT RESEARCH PROJECT MANAGER: Mr. Anthony Chmiel
TASK ORDER NUMBER/Study Number: Task Order No. 83 / 4-23914	PRINCIPAL INVESTIGATOR: Dr. Ali Maher
Project Starting Date: 3/01/2001 **Original** Project Ending Date: 12/31/2002 **Modified Completion Date: 8/31/2003**	Period Covered: 2nd Quarter 2004

Task	% of Total	% of Task this quarter	% of Task to date	% of Total Complete
Literature Search	5%	0%	100%	5%
1. Material Collection	5%	0%	100%	5%
2. Laboratory Testing	60%	5%	100%	60%
3. Calibration	10%	10%	100%	10%
4. Reporting	20%	30%	100%	20%
Final Report				
TOTAL	100%			100%

Project Objectives:

- Determine the potential change in performance testing results when comparing aggregates from the different areas of the NJDOT gradation specification
- Evaluate the use of recycled asphalt pavement (RAP) and recycled concrete aggregate (RCA) under similar performance testing
- Mix the RAP and RCA to different percentage blends of current NJDOT specified aggregates and provide guidance as to the maximum amount of recycled material based on performance testing

Project Abstract:

Currently, the NJDOT specifies base and subbase aggregates through gradation requirements. However, the current gradation specifications are very broad and could potentially allow for the material's performance to vary. Therefore, a research project was developed to evaluate the performance of the aggregates at gradations that represented the high, middle, and low end of the gradation specification band. The aggregate's natural gradation was also tested. This would allow the NJDOT to justify the potential modifying of the gradation specification to maximize the performance of the aggregate material.

1. Progress this quarter by task:

The final analysis of the re-rum resilient modulus data is completed and the final report is being generated. The results have recommended that the gradation bands be tightened so as not to allow such as wide range of potential performance properties (permeability, triaxial strength, resilient modulus, etc.). This would allow project engineers to feel more comfortable with solely specifying by gradation, as a tighter gradation band would provide more consistent properties.

2. Proposed activities for next quarter by task:

N.A.

3. List of deliverables provided in this quarter by task (product date):

N.A.

4. Progress on Implementation and Training Activities:

N.A.

5. Problems/Proposed Solutions:

N.A.

Total Project Budget	$286,041.00
Modified Contract Amount:	
Total Project Expenditure to date	$283,893
% of Total Project Budget Expended	99%

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NJDOT Bureau of Research
QUARTERLY PROGRESS REPORT

Project Title:	Rut Testing of Hot Mix Asphalt
RFP NUMBER:	NJDOT RESEARCH PROJECT MANAGER: W. Lad Szalaj
TASK ORDER NUMBER/Study Number: Task Order No. 98 / 4-26677	PRINCIPAL INVESTIGATOR: Dr. Ali Maher
Project Starting Date: 1/01/2003 **Original** Project Ending Date: 12/31/2003 **Modified Completion Date:**	Period Covered: 2nd Quarter 2004

Task	% of Total	% of Task this quarter	% of Task to date	% of Total Complete
Literature Search/Local Agency Survey	10%	0%	100%	10%
Lab Testing for Rutting Criteria	25%	0%	100%	25%
Lab Testing for NJ HMA Characterization	25%	10%	100%	25%
Lab Testing for SUPERPAVE vs Marshall	20%	15%	100%	20%
Field Calibration/Evaluation	10%	55%	100%	10%
Final Report	10%	25%	100%	10%
TOTAL	100%			100%

Project Objectives:

- Select 4 pavement surfaces on New Jersey low volume roads that are performing well (and have performed well for a number of years) and are designed using the Marshall design process
- Obtain the original job mix formula for each location, sample materials from the identical material source, and conduct the Marshall design in the laboratory to compare to the JMF
- Using the identical materials, perform the Superpave design process and compare the volumetric results to the Marshall design values
- Test both design samples under the Asphalt Pavement Analyzer (APA) and permeability
- Determine the appropriate number of design gyrations needed by the Superpave design method to provide identical volumetric properties as the Marshall design

Project Abstract:

Currently, local aide utilizes the Marshall design for HMA materials on local roads. However, by 2005, the NJDOT will not provide specification for Marshall design, only for Superpave design, thus simplifying both the testing specifications and the design books at the suppliers. Unfortunately, many local aide engineers are resisting the move to Superpave because they feel it may be too complicated and not provide the same performance as the time test Marshall mixes.

The research was to evaluate four Marshall mixes that are performing well in the field and evaluate them under the Superpave design methodology. Volumetric analysis and performance testing were also conducted to evaluate if differences exist between the two mixes. The end result of the work being a document that the local aide can use to illustrate that only minor to no differences exist between the two design methodologies when designing low volume roads.

1. Progress this quarter by task:

A final report is being generated. The volumetric correlations are being finalized for the ternary plot formulation which utilizes effective binder content, air voids, and VMA to predict the performance of HMA. Also, one more set of fatigue testing is being added to try to clear up the fatigue conclusions. Previously, 300, 800, and 1300 micro-strains were used for the analysis. However, the comparisons were somewhat in-conclusive so it was decided to run another set of samples at 500 micro-strain to re-calculate the final fatigue predictions.

2. Proposed activities for next quarter by task:
N.A.

3. List of deliverables provided in this quarter by task (product date):
N.A.

4. Progress on Implementation and Training Activities:
N.A.

5. Problems/Proposed Solutions:
N.A.

Total Project Budget	$391,867.00
Modified Contract Amount:	
Total Project Expenditure to date	$391,867.00
% of Total Project Budget Expended	100%

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NJDOT Bureau of Research
QUARTERLY PROGRESS REPORT

Project Title:	Geopolymer Protective & Graffiti Resistant Coating (I-295 Scenic Overlook)

RFP NUMBER: N/A	NJDOT RESEARCH PROJECT MANAGER: Robert Sasor
TASK ORDER NUMBER: 145/4-29065	PRINCIPAL INVESTIGATOR: P. Balaguru
Project Starting Date: 10/15/2003 **Original** Project Ending Date: 10/15/2004 **Modified Completion Date:**	Period Covered: 2nd Quarter 2004

Task	% of Total	% of Task this quarter	% of Task to date	% of Total Complete
Literature Search	5%	25%	50%	2.5%
1. Lab tests	25%	20%	70%	17.5%
2. Field implementation	60%	0%	1%	0%
Final Report	10%	0%	0%	0%
TOTAL	100%	0%	0%	20%

Project Objectives:

Project Abstract:

1. Progress this quarter by task: More coatings were made at the laboratory

2. Proposed activities for next quarter by task: Continue laboratory work

3. List of deliverables provided in this quarter by task (product date):N/A

4. Progress on Implementation and Training Activities: N/A

5. Problems/Proposed Solutions: None

Total Project Budget	$10,000
Modified Contract Amount:	
Total Project Expenditure to date	$357
% of Total Project Budget Expended	4%

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Department of Civil and Environmental Engineering
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NJDOT Bureau of Research
QUARTERLY PROGRESS REPORT

Project Title:	Material Characterization and Seasonal Variation in Material Properties
RFP NUMBER:	NJDOT RESEARCH PROJECT MANAGER: Mr. Tony Chmiel
TASK ORDER NUMBER: Task Order No. 100 / 4-26701	PRINCIPAL INVESTIGATOR: Dr. Nenad Gucunski
Project Starting Date: 01/01/2001 **Original** Project Ending Date: 12/31/2004 **Modified Completion Date:**	Period Covered: 2nd Quarter 2004

Task	% of Total	% of Task this quarter	% of Task to date	% of Total Complete
Selection of Test Sections	5	0	100	5
Field Testing & Instrumentation	50	5	100	50
Analysis	35	10	75	26.2
Reporting	10	5	50	5
TOTAL	100%			86.2

Project Objectives:

The main objective of this study is to calibrate the AASHTO temperature and seasonal adjustment models, or to develop new models. These models will be based on New Jersey conditions and will be used in network and project level FWD analysis.

Project Abstract:

This study is being conducted to calibrate the AASHTO models, or to develop new models, for temperature and seasonal adjustment to suit New Jersey conditions. These models will be used in the network and project level FWD analysis. To achieve the objective of study, twenty-four pavement sections were instrumented and nondestructive testing (NDT) program is being conducted for a period of two years. The main task of the instrumentation is to monitor environmental parameters: air and pavement temperature, moisture, frost/thaw depth and rainfall. Seismic Pavement Analyzer (SPA) and Falling Weight Deflectometer (FWD) are used to evaluate the pavement structural response and its properties on a monthly basis, except during the spring thaw period when it is on a bi-monthly basis. The models will be developed by performing statistical analyses, such as analysis of variance (ANOVA) and regression analysis.

1. Progress this quarter by task:

The FWD Testing and Climatic data collection at the instrumented LTPP and non-LTPP sites and corresponding office processing continued during the reporting period.

1. The FWD and SPA testing is completed. The last cycle of FWD and SPA field testing was done in March for LTPP sites SPS5 and SPS9, and in April for non-LTPP site NJ 1-7.
2. Climatic Data was collected for all the LTPP and Non-LTPP sites.
3. Processing of FWD and SPA data for the reporting period is in progress.
4. A correlation analysis is being carried out.

2. Proposed activities for next quarter by task:

- Continue analysis on environmental, FWD and SPA data.
- Continue with model development.

3. List of deliverables provided in this quarter by task (product date):

4. Progress on Implementation and Training Activities:

N/A

5. Problems/Proposed Solutions:

N/A

Total Project Budget	$1,779,642.00
Modified Contract Amount:	
Total Project Expenditure to date	$1,581,036
% of Total Project Budget Expended	89%

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QUARTERLY PROGRESS REPORT

Project Title:	Transportation Safety Professional Development Clearinghouse
RFP NUMBER: N/A	NJDOT/FHWA RESEARCH PROJECT MANAGER(S): Pat Ott
TASK ORDER NUMBER/Study Number: Task Order No. 144/ 4-29063	PRINCIPAL INVESTIGATOR: Ali Maher/Joe Orth/Claudia Knezek/Carol Greenberg
Project Starting Date: 12/1/2003 **Original** Project Ending Date: 12/1/2005 **Modified Completion Date:**	Period Covered: 2nd Quarter 2004

Task	% of Total	% of Task this quarter	% of Task to date	% of Total Complete
1.0 Literature Search				
1.1 Conduct literature search	20	20	55	11
1.2 Prepare Presentation for NJDOT/FHWA	5	10	15	.75
2.0 Assessment			0	
2.1 Conduct Professional Assessment	20		0	
2.2 Present Findings to NJDOT/FHWA	5		0	
3.0 Training			0	
3.1 Schedule/Recruit Technical Training	10.5		0	
3.2 Distribute Information	3.5		0	
3.3 Organize Career Resource Center	6		0	
3.4 Develop Online Resource	30		0	
TOTAL	100			11.75%

Project Objectives: The goal of the Transportation Safety Professional Development Clearinghouse is to develop a pilot project that will provide assessment tools and online capabilities to promote and track continuing education activities for transportation safety professionals throughout New Jersey.

Project Abstract: Nationwide, the transportation community is facing a potential workforce crisis by the year 2010 because of the anticipated retirement and early retirement of the generation known as the “baby boomers”. This potential loss of experience and expertise, along with advances in technology and an increased emphasis on safety and national security, has prompted Federal and State transportation agencies to focus on employee development as one of their strategic goals.

The CAIT-LTAP staff will work with managers and staff members of the transportation community to provide strategies for organizing professional development opportunities for transportation personnel. They will research training formats currently available to adult learners and evaluate the major delivery systems, including distance learning and traditional programs available through FHWA and other transportation agencies, to determine acceptability for training purposes. CAIT-LTAP will assist managers in conducting assessments of employees in order to determine the appropriate individual career development plan that is needed to fulfill professional goals. CAIT-LTAP will make recommendations regarding training opportunities that are available to staff members and will create an online data base accessible to each employee, incorporating appropriate security to maintain confidentiality. Assessments and individual development plans will be reviewed to determine a widespread need for a specific workshop, which would then be scheduled at Rutgers University.

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For limited training needs, the Rutgers staff will refer users to appropriate agencies that sponsor the needed training as well as neighboring colleges offering graduate and undergraduate courses.

This project will provide transportation facilitators, providers, and users with an online resource to archive and track continuing education in New Jersey. Specifically, it will allow NJDOT to track participants that are required to take safety training in New Jersey.

Progress this quarter by task:

1.1 The literature review has continued on a limited basis
1.2 Development of a questionnaire to gather business requirements
1.2 Met with DOT principals to clarify needs and refine scope of project

Proposed activities for next quarter by task:

1.1 Continuation of the literature review.
1.2 A) Meet with FHWA principals to clarify needs and refine scope of project.
B) Prepare presentation for FHWA and DOT.
1.2.1 Incorporate results of questionnaire into a Business Requirements document

List of deliverables provided in this quarter by task (product date):

1.2 Questionnaire (June, 2004)

Progress on Implementation and Training Activities:

Not at implementation.

Problems/Proposed Solutions:

Since the professional development needs of Federal, State, and Local transportation professionals may be quite different, clarification of these needs is required in order to develop a plan that will be beneficial for all agencies. To achieve this, one or more additional meetings will be scheduled to further define the scope of the project and an on-line questionnaire will be utilized to identify the needs of the safety professionals in the State of New Jersey.

Total Project Budget	$ 312,345.00
Modified Contract Amount	
Total Project Expenditure to date	$688
% of Total Project Budget Expended	.22%

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NJDOT Bureau of Research
QUARTERLY PROGRESS REPORT

Project Title:	TRANSPORTATION SAFETY RESOURCE CENTER
RFP NUMBER:	NJDOT RESEARCH PROJECT MANAGER: Patricia Ott
TASK ORDER NUMBER:	PRINCIPAL INVESTIGATOR: Dr. Ali Maher
Project Starting Date: 4/1/2004 **Original** Project Ending Date: 12/31/2005 **Modified Completion Date:**	Period Covered: 2nd Quarter 2004

Task	% of Total	% of Task this quarter	% of Task to date	% of Total Complete
1. Startup	25	100	100	25
2. Database Development	25	0	0	0
3. Analysis/Traffic Engineering	25	0	0	0
4. Technology Transfer	10	0	0	0
TOTAL	100%			25%

Project Objectives:

The center will strive to assist NJDOT in their efforts to improve highway safety by creating a new core program that consolidates existing efforts championed by both the Federal Highway Administration (FHWA) and the National Highway Traffic Safety Administration (NHTSA). The TSRC will provide services to the NJDOT Division of Traffic Engineering and Safety Programs, along with technical support on merging specialized data sources with the New Jersey Crash Records System.

More Specifically the TSRC will partner with the NJDOT to develop and deliver training programs and technical assistance programs to supply the locals with the preliminary analysis of crash data using advanced decision support systems. The TSRC will also provide support to the New Jersey Safety Conscious Planning (SCP) Network that has been established between NJDOT and the Metropolitan Planning Organizations (MPO). Research and Technical support will also be provided to NJDOT with the efforts to establish a comprehensive Safety Management System (SMS) which will integrate existing and yet to be identified databases involving both traditional and non-traditional stakeholders.

The center will be focused on assisting locals with developing safety solutions that meet the “tier one” or quick fix/low cost projects. By using the resources of the center, the local users will package and present their problems to NJDOT along with potential solutions. This will then allow for a much more efficient and objective response from the NJDOT.

Project Abstract:

The Transportation Safety Resource Center is a partnership between federal and state transportation agencies, local stakeholders, academic institutions, and the private sector to provide technical and educational services to address transportation safety in New Jersey.

1. Progress this quarter by task:

- A comprehensive literature search was conducted to identify and evaluate other centers similar to the TSRC to use as paradigms.
- During this quarter the space retrofitting was undertaken to provide temporary offices for the TSRC.
- TSRC Advisory Committee meetings were held with both DOT and FHWA.
- Preliminary Database Development began.

2. Proposed activities for next quarter by task:

- Launching the website for the TSRC.
- Moving the TSRC into the retrofitted temporary offices.
- Beginning the work on database development.

3. List of deliverables provided in this quarter by task (product date):

None at this time.

4. Progress on Implementation and Training Activities:

Not at implementation.

5. Problems/Proposed Solutions:

Due to hold accounts full-time staff cannot not be hired. The contracts are being moving through the process at this time and will allow for the hiring of full time staff. Measures are being taken in order to expedite implementation when contracts are fully executed.

Total Project Budget	$850,000
Modified Contract Amount:	
Total Project Expenditure to date	0
% of Total Project Budget Expended	0%

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NJDOT Bureau of Research
QUARTERLY PROGRESS REPORT

Project Title:	Implementation of Weigh-In-Motion (WIM) Systems
RFP NUMBER:	NJDOT RESEARCH PROJECT MANAGER: W. Lad Szalaj
TASK ORDER NUMBER: 92 / 4-23941	PRINCIPAL INVESTIGATOR: Dr. Ali Maher
Study Start Date: 06/14/2000 **Original** Study End Date: 12/31/2003 **Modified Completion Date: 6/30/2004**	Period Covered: 2nd Quarter 2004

Task	% of Total	% of Task this quarter	% of Task to date	% of Total Complete
Literature Search	10%	0%	100%	10%
1. Packaging	17%	0%	100%	17%
2. Testing	14%	0%	100%	14%
3. Site Determination	11%	10%	100%	11%
4. Field Implementation & Calibration	16%	5.6%	90.6%	14.5%
5. Monitoring and Analysis	22%	15%	15%	3.3%
Final Report	10%	0%	0%	0%

1. Progress this quarter by task:

A. The new DAQ software program was tested on an office P.C. while awaiting the return of the portable DAQ unit.

1. It was determined that the new code was inadequate for the degree of accuracy desired.
2. In order to achieve a greater degree of accuracy, a new program was created that would allow a faster sampling rate as to provide more data points to be gathered for a higher resolution.

B. The DAQ computer was received back from the vendor. It had been outfitted with a new motherboard and CPU. As agreed to, this service included free labor for the replacement of these critical parts.

C. The DAQ hardware and new code was then reinstalled into portable DAQ unit.

1. During testing of the new program on the portable DAQ unit, the system failed. The screen was then only functioning in DOS mode.
2. After several in house attempts to restore the computer it was decided that the unit would be sent back to the vendor who resolve the issue without any labor charges.
3. It was decided that from this point on, the portable unit was a hindrance to the project and all further studies would be conducted form the P.C.
4. Once received by the vendor the prognosis was that the hard drive was damaged and had to be reformatted. After reformatting the unit was said to be functional.

D. The DAQ hardware and new code was once again transferred into the P.C.

E. In preparation of acquiring data from the site, a preliminary visit was done to check on the condition of the sensors.

1. The site visit revealed that the pavement at the trailing side of both sensors was deteriorating. The asphalt surrounding one sensor totally gave way and allowed the first sensor (in the direction of traffic flow) to sheer in half, exposing the remainder of its internals.

2. The sheered sensor was completely removed and its void was patched as was the pothole forming at the second sensor.

F. The second sensor has been tested and is still working.

2. Proposed activities for next quarter by task:
   A. Data collection from working sensor with vehicle of known weight for calibration purposes.
   B. Comparison of weight from weighing station to that of weight calculated from data attained.

3. List of deliverables provided in this quarter by task (product date):
   N/A
4. Progress on Implementation and Training Activities:
   N/A
5. Problems/Proposed Solutions:
   The asphalt was deteriorating and left a void on the trailing side of the sensor. This matter was resolved by compacting the void with cold patch.

Total Project Budget	$194,500.00
Modified Contract Amount:	
Total Project Expenditure to date	$104,251
% of Total Project Budget Expended	54%

* These are approximate expended amounts for the project; these estimates are for reference only and should not be used for official accounting purposes. For a more accurate project accounting please review the quarterly invoice for this project.